STATE LIBRARY OF PENNSYLVANIA
3 0144 00081593 6
c.1
PY
S9642.2
W324q
1994
c.1

Publication No. 165

Monitoring Report #8

WATER QUALITY OF INTERSTATE STREAMS IN THE SUSQUEHANNA RIVER BASIN

July 1, 1993–June 30, 1994

SUSQUEHANNA RIVER BASIN COMMISSION

August 1995

PENNSYLVANIA STATE LIBRARY
DOCUMENTS SECTION

STATE LIBRARY OF PENNSYLVANIA
1745

TD 353.2.2 W324q 1994 c.1

Monitoring Report #8

WATER QUALITY OF INTERSTATE STREAMS IN THE SUSQUEHANNA RIVER BASIN

July 1, 1993–June 30, 1994

PREPARED BY

Scott W. Bollinger
Environmental Specialist

Division of Water Quality and Monitoring Programs

Printed on recycled paper

The work upon which this report is based was supported by federal funds provided by the United States Environmental Protection Agency under a Water Pollution Control-Statewide Interstate Program Grant Number I-003922-94-0.

SUSQUEHANNA RIVER BASIN COMMISSION

Paul O. Swartz, Executive Director

Daniel J. Campbell, N.Y. Commissioner
Warren T. Lavery, N.Y. Alternate

James M. Seif, Pa. Commissioner
Dr. Hugh V. Archer, Pa. Alternate

Jane Nishida, Md. Commissioner
J.L. Hearn, Md. Alternate

Bruce Babbitt, U.S. Commissioner
Kenneth J. Cole, U.S. Alternate

The Susquehanna River Basin was created as an independent agency by a federal-interstate compact* among the states of Maryland, New York, Commonwealth of Pennsylvania, and the federal government. In creating the Commission, the Congress and state legislatures formally recognized the water resources of the Susquehanna River Basin as a regional asset vested with local, state, and national interests for which all the parties share responsibility. As the single federal-interstate water resources agency with basinwide authority, the Commission's goal is to effect coordinated planning, conservation, management, utilization, development and control of basin water resources among the government and private sectors.

*Statutory *Citations: Federal - Pub. L. 91-575, 84 Stat. 1509 (December 1970); Maryland - Natural Resources Sec. 8-301 (Michie 1974); New York - ECL Sec. 21-1301 (McKinney 1973); and Pennsylvania - 32 P.S. 820.1 (Supp. 1976).*

Publication No. 165
August 1995

For additional copies, contact the Susquehanna River Basin Commission, 1721 N. Front Street, Harrisburg, PA 17102-2391, (717) 238-0425 of FAX (717) 238-2436.

CONTENTS

INTRODUCTION 1

BASIN GEOGRAPHY 1

METHODS 5

Sampling Frequency 5
Stream Discharge 5
Water Samples 5
Field Chemistry 14
Macroinvertebrate Sampling 14
Data Synthesis 14

RESULTS 15

New York-Pennsylvania Border Streams 16
Pennsylvania-Maryland Border Streams 17

REFERENCES 121

APPENDIX

A. WATER QUALITY DATA FOR INTERSTATE STREAMS CROSSING THE NEW YORK-PENNSYLVANIA AND PENNSYLVANIA-MARYLAND BORDERS 47

B. MACROINVERTEBRATE DATA FOR INTERSTATE STREAMS CROSSING THE NEW YORK-PENNSYLVANIA AND PENNSYLVANIA-MARYLAND BORDERS 69

ILLUSTRATIONS

1. Map Showing the Susquehanna River Basin 2

2. Interstate Streams Along the New York-Pennsylvania Border Between Cascade Creek and Apalachin Creek 9

3. Interstate Streams Along the New York-Pennsylvania Border Between Seeley Creek and Wappasening Creek 10

4. Interstate Streams Along the New York-Pennsylvania Border Between North Fork Cowanesque River and Tioga River 11

5. Interstate Streams Along the Pennsylvania-Maryland Border 12

6. Parameters Exceeding Water Quality Standards 16

TABLES

1. Interstate Streams in the Susquehanna River Basin 3

2. Stream Stations Sampled Along the New York-Pennsylvania Border and Sampling Rationale 6

3. Stream Stations Sampled Along the Pennsylvania-Maryland Border and Sampling Rationale 8

4. Monitored Parameters 13

5. Water Quality Standards 15

6. Water Quality Summary Susquehanna River at Windsor, N.Y. 19

7. Water Quality Summary Snake Creek at Brookdale, Pa. 20

8. Water Quality Summary Little Snake Creek at Brackney, Pa..... 21

9. Water Quality Summary Susquehanna River at Kirkwood, N.Y..... 22

10. Water Quality Summary Choconut Creek at Vestal Center, N.Y..... 23

11. Water Quality Summary Apalachin Creek at Little Meadows, Pa..... 24

12. Water Quality Summary Wappasening Creek at Nichols, N.Y. 25

13. Water Quality Summary Cayuta Creek at Waverly, N.Y. 26

14. Water Quality Summary Troups Creek at Austinburg, Pa..... 27

15. Water Quality Summary Cowanesque River at Lawrenceville, Pa..... 28

16. Water Quality Summary Tioga River at Lindley, N.Y. 29

17. Water Quality Summary Seeley Creek at Seeley Creek, N.Y..... 30

18. Water Quality Summary South Creek at Fassett, Pa. 31

19. Water Quality Summary Bentley Creek at Wellsburg, N.Y. 32

20. Water Quality Summary Chemung River at Chemung, N.Y. 33

21. Water Quality Summary Susquehanna River at Sayre, Pa. 34

22. Water Quality Summary South Branch Conewago Creek at Bandanna, Pa. 35

23. Water Quality Summary Long Arm Creek at Bandanna, Pa. 36

24. Water Quality Summary Susquehanna River at Marietta, Pa. 37

25. Water Quality Summary Scott Creek at Delta, Pa. 38

26. Water Quality Summary Conowingo Creek at Pleasant Grove, Pa. 39

27. Water Quality Summary Octoraro Creek at Rising Sun, Md. 40

28. Water Quality Summary Ebaughs Creek at Stewartstown, Pa. 41

29. Water Quality Summary Deer Creek at Gorsuch Mills, Md. 42

30. Water Quality Summary Big Branch Deer Creek at Fawn Grove, Pa. 43

31. Water Quality Summary Falling Branch Deer Creek at Fawn Grove, Pa. 44

32. Water Quality Summary Susquehanna River at Conowingo, Md. 45

A1. Water Quality Data for Interstate Streams Crossing the New York-Pennsylvania Border 49

A2. Water Quality Data for Interstate Streams Crossing the Pennsylvania-Maryland Border 59

B1. Macroinvertebrate Data for Susquehanna River at Windsor, N.Y., 1986-93 71

B2. Macroinvertebrate Data for Snake Creek at Brookdale, Pa., 1986-93 73

B3. Macroinvertebrate Data for Little Snake Creek at Brackney, Pa., 1988-93 75

B4. Macroinvertebrate Data for Susquehanna River at Kirkwood, N.Y., 1986-93 77

B5. Macroinvertebrate Data for Choconut Creek at Vestal Center, N.Y., 1988-93 79

B6. Macroinvertebrate Data for Apalachin Creek at Little Meadows, Pa., 1988-93 81

B7. Macroinvertebrate Data for Wappasening Creek at Nichols, N.Y., 1988-93 83

B8. Macroinvertebrate Data for Cayuta Creek at Waverly, N.Y., 1986-93 85

B9. Macroinvertebrate Data for Troups Creek at Austinburg, Pa., 1988-93 87

B10. Macroinvertebrate Data for Cowanesque River at Lawrenceville, Pa., 1988-93 89

B11. Macroinvertebrate Data for Tioga River at Lindley, N.Y., 1986-93 90

B12. Macroinvertebrate Data for Seeley Creek at Seeley Creek, N.Y., 1986-93 92

B13. Macroinvertebrate Data for South Creek at Fassett, Pa., 1988-93 94

B14. Macroinvertebrate Data for Bentley Creek at Wellsburg, N.Y., 1986-93 96

B15. Macroinvertebrate Data for Chemung River at Chemung, N.Y., 1986-93 98

B16. Macroinvertebrate Data for Susquehanna River at Sayre, Pa., 1986-93 100

B17. Macroinvertebrate Data for South Branch Conewago Creek at Bandanna, Pa., 1988-93 102

B18. Macroinvertebrate Data for Long Arm Creek at Bandanna, Pa., 1988-93 104

B19. Macroinvertebrate Data for Susquehanna River at Marietta, Pa., 1986-93 105

B20. Macroinvertebrate Data for Scott Creek at Delta, Pa., 1989-93 107

B21. Macroinvertebrate Data for Conowingo Creek at Pleasant Grove, Pa., 1986-93 108

B22. Macroinvertebrate Data for Octoraro Creek at Rising Sun, Md., 1986-93 110

B23. Macroinvertebrate Data for Ebaughs Creek at Stewartstown, Pa., 1986-93 112

B24. Macroinvertebrate Data for Deer Creek at Gorsuch Mills, Md., 1986-93 114

B25. Macroinvertebrate Data for Big Branch Deer Creek at Fawn Grove, Pa., 1989-93 .. 116

B26. Macroinvertebrate Data for Falling Branch Deer Creek at Fawn Grove, Pa., 1989-93 118

ABSTRACT

Water samples were collected from 27 stations on interstate streams crossing the New York-Pennsylvania and Pennsylvania-Maryland borders between July 1, 1993, and June 30, 1994. Samples were collected every other month from streams judged to have a high potential for degradation. Streams judged to have a moderate potential for degradation were sampled once during July and August 1993. Benthic macroinvertebrates were sampled at each station in July and August 1993. The data collected are used to assess compliance with water quality standards, to assess impacts on water quality, to characterize ambient and seasonal stream quality, and to assess future trends.

Most interstate streams have good water quality. Only 31 of the 2,784 analyses exceeded water quality standards. Iron most commonly exceeded standards.

Scott Creek receives untreated sewage discharges from Cardiff, Md., which result in poor water quality and an impaired biological community. Cayuta Creek, the Chemung River, and Ebaughs Creek have elevated chemical concentrations due to wastewater discharges. Acid mine drainage to the Tioga River contributes to elevated metals concentrations. Conowingo Creek has elevated nutrient concentrations due to agricultural runoff in the watershed.

Digitized by the Internet Archive
in 2017 with funding from
This project is made possible by a grant from the Institute of Museum and Library Services as administered by the Pennsylvania Department of Education through the Office of Commonwealth Libraries

https://archive.org/details/waterqualityofin00unse_6

INTRODUCTION

The Susquehanna River Basin Commission (SRBC) reviews projects and policies for potential impacts on interstate water resources in the Susquehanna River Basin. Current water quality data are needed to conduct these reviews. Monitoring programs conducted by New York, Pennsylvania, and Maryland do not produce comparable data and do not assess all the interstate streams. Therefore, the SRBC established a monitoring program to collect data needed to assess potential impacts on the water quality of interstate streams. This ongoing program is partially funded through a grant from the U.S. Environmental Protection Agency.

The monitoring program includes periodic collection of water and biological samples from interstate streams. Chemical data are used to assess compliance with state water quality standards, to characterize stream quality and seasonal variations, and to build a database for the future assessment of water quality trends. Biological conditions are monitored by assessing benthic macroinvertebrate populations. Macroinvertebrate populations provide an indication of the biological health of a stream and serve as indicators of water quality.

Monitoring began in April 1986. Results were originally reported for water years that run from October to September (McMorran, 1988; McMorran and Bollinger, 1989; McMorran and Bollinger, 1990; Bollinger, 1991; Bollinger, 1992; Bollinger, 1993). This report is presented for the SRBC fiscal year that covers the period from July 1, 1993, to June 30, 1994.

BASIN GEOGRAPHY

The Susquehanna River Basin is the largest river basin on the Atlantic Coast of the United States; draining 27,580 square miles (Figure 1). The Susquehanna River originates at the outlet of Otsego Lake, Cooperstown, N.Y., and flows 444 miles through New York, Pennsylvania, and Maryland to the Chesapeake Bay at Havre de Grace, Maryland. Eighty-three streams cross state lines in the basin (Table 1). Some streams traverse the state lines at several places, contributing to a total of 91 crossings. At 45 of these locations, streams flow from New York into Pennsylvania. Twenty-two reaches cross from Pennsylvania into New York, 15 from Pennsylvania into Maryland, and nine from Maryland into Pennsylvania. Many streams are small; 32 are unnamed.

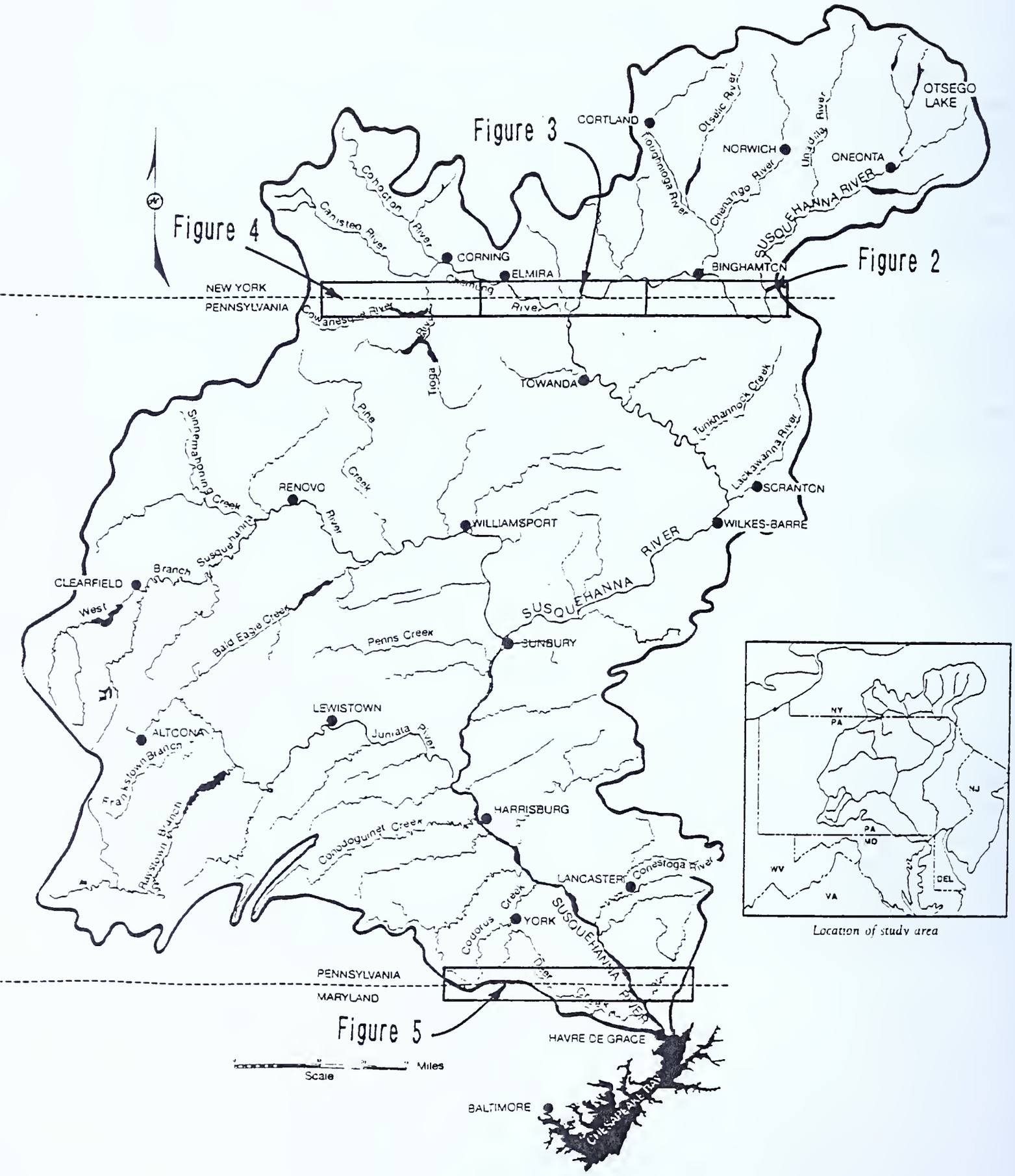


FIGURE 1. Map Showing the Susquehanna River Basin

TABLE 1. Interstate Streams in the Susquehanna River Basin

Stream Name	Monitoring Group	Flow Direction (from → to)
Streams Along the New York-Pennsylvania Border		
Apalachin Creek	2	Pa.→N.Y.
Babcock Run	3	N.Y.→Pa.
Bentley Creek	2	Pa.→N.Y.
Bill Hess Creek	3	N.Y.→Pa.
Bird Creek	3	Pa.→N.Y.
Biscuit Hollow	3	N.Y.→Pa.
Briggs Hollow Run	3	N.Y.→Pa.
Bulkley Brook	3	N.Y.→Pa.
Camp Brook	3	N.Y.→Pa.
Cascade Creek	2	N.Y.→Pa.
Cayuta Creek	1	N.Y.→Pa.
Chemung River	1	N.Y.→Pa.→N.Y.→Pa.
Choconut Creek	2	Pa.→N.Y.
Cook Hollow	3	N.Y.→Pa.
Cowanesque River	1	Pa.→N.Y.
Deep Hollow Brook	3	N.Y.→Pa.
Denton Creek	3	N.Y.→Pa.
Dry Brook	3	N.Y.→Pa.
Holden Creek	2	N.Y.→Pa.
Little Snake Creek	2	Pa.→N.Y.
Little Wappasening Creek	3	Pa.→N.Y.
North Fork Cowanesque River	2	N.Y.→Pa.
Parks Creek	3	Pa.→N.Y.
Prince Hollow Run	3	N.Y.→Pa.
Red House/Beagle Hollow	3	N.Y.→Pa.
Russell Run	3	N.Y.→Pa.
Sackett Creek	3	Pa.→N.Y.
Seeley Creek	2	Pa.→N.Y.
South Creek	2	Pa.→N.Y.
Snake Creek	2	Pa.→N.Y.
Strait Creek	3	N.Y.→Pa.
Susquehanna River	1	N.Y.→Pa.→N.Y.→Pa.
Tioga River	1	Pa.→N.Y.
Troups Creek	1	N.Y.→Pa.
Trowbridge Creek	2	N.Y.→Pa.
Wappasening Creek	2	Pa.→N.Y.

TABLE 1. Interstate Streams in the Susquehanna River Basin (Continued)

Stream Name	Monitoring Group	Flow Direction (from → to)
Streams Along the New York-Pennsylvania Border		
White Branch	3	N.Y.→Pa.
White Hollow	3	Pa.→N.Y.
17 Unnamed tributaries	3	N.Y.→Pa.
2 Unnamed tributaries	3	Pa.→N.Y.
2 Unnamed tributaries	3	Pa.→N.Y.→Pa.
1 Unnamed tributary	3	N.Y.→Pa.→N.Y.
Streams Along the Pennsylvania-Maryland Border		
Big Branch Deer Creek	2	Pa.→Md.
Conowingo Creek	1	Pa.→Md.
Deer Creek	1	Pa.→Md.
Ebaughs Creek	1	Pa.→Md.
Falling Branch Deer Creek	2	Pa.→Md.
Island Branch	3	Pa.→Md.
Long Arm Creek	2	Md.→Pa.
Octoraro Creek	1	Pa.→Md.
Scott Creek	1	Md.→Pa.
South Branch Conewago Creek	2	Md.→Pa.
Susquehanna River	1	Pa.→Md.
6 Unnamed tributaries	3	Md.→Pa.
7 Unnamed tributaries	3	Pa.→Md.

METHODS

Sampling Frequency

In Water Year 1989, the interstate streams were divided into three groups according to the degree of water quality impairment and potential for degradation.

Streams with impaired water quality or that were judged to have a high potential for degradation were assigned to Group 1. Water samples were collected from these stations every other month except for the months of January and February. Sampling was alternated so that streams along the New York-Pennsylvania border were sampled during July, September, November, March, and May and streams along the Pennsylvania-Maryland border were sampled during August, October, December, April, and June. Benthic macroinvertebrates were collected at Group 1 stations during July and August 1993.

Streams judged to have a moderate potential for impacts were assigned to Group 2. Water quality and macroinvertebrate samples were obtained from Group 2 stations once a year during July and August 1993.

Streams that were judged to have a low potential for impacts were assigned to Group 3. These stations were not sampled, but were visually inspected for signs of degradation once a year.

Stream stations sampled during Fiscal Year 1994 are listed in Tables 2 and 3 and shown on Figures 2 through 5.

Stream Discharge

Stream discharge was measured at all stations unless high streamflows made access impossible. Several stations are located near United States Geological Survey (USGS) stream gages. These stations include the following: the Susquehanna River at Windsor, N.Y., Kirkwood, N.Y., Sayre, Pa., Marietta, Pa., and Conowingo, Md.; the Chemung River at Chemung, N.Y.; the Tioga River at Lindley, N.Y.; and the Cowanesque River at Lawrenceville, Pa. Stream discharges from USGS gaging stations are reported as instantaneous discharges in cubic feet per second (cfs). Instantaneous discharge for stations not located near USGS gaging stations was measured at the time of sampling, using standard USGS procedures.

Water Samples

Water samples were collected at each of the sites to measure nutrient and metal concentrations. The chemical and physical parameters are listed in Table 4. Water samples were collected using a depth-integrating sampler.

TABLE 2. Stream Stations Sampled Along the New York-Pennsylvania Border and Sampling Rationale

Station	Stream and Location	Monitoring Group	Rationale
SUSQ 365.0	Susquehanna River, Windsor, N.Y.	1	Large drainage area (1,882 sq. mi.); municipal discharges from Cooperstown, Sidney, Bainbridge, and Oneonta
CASC 1.6	Cascade Creek, Lanesboro, Pa.	2	Monitor for potential water quality impacts
TROW 1.6	Trowbridge Creek, Great Bend, Pa.	2	Monitor for potential water quality impacts
SNAK 2.3	Snake Creek, Brookdale, Pa.	2	Monitor for potential water quality impacts.
LSNK 7.6	Little Snake Creek, Brackney, Pa.	2	Monitor for potential water quality impacts
SUSQ 340.0	Susquehanna River, Kirkwood, N.Y.	1	Large drainage area (2,232 sq. mi.); historical pollution due to sewage from Lanesboro, Oakland, Susquehanna, Great Bend, and Hallstead
CHOC 9.1	Choconut Creek, Vestal Center, N.Y.	2	Monitor for potential water quality impacts
APAL 6.9	Apalachin Creek, Little Meadows, Pa.	2	Monitor for potential water quality impacts
WAPP 2.6	Wappasening Creek Nichols, N.Y.	2	Monitor for potential water quality impacts
CAYT 1.7	Cayuta Creek, Waverly, N.Y.	1	Municipal discharge from Waverly
NFCR 7.6	North Fork Cowanesque River, North Fork, Pa.	2	Monitor for potential water quality impacts
TRUP 4.5	Troups Creek, Austinburg, Pa.	1	High turbidity and moderately-impaired macroinvertebrate populations
HLDN 3.5	Holden Creek, Woodhull, N.Y.	2	Monitor for potential water quality impacts
COWN 2.2	Cowanesque River, Lawrenceville, Pa.	1	Impacts from flood control reservoir
TIOG 10.8	Tioga River, Lindley, N.Y.	1	Pollution from acid mine discharges and impacts from flood control reservoirs.
SEEL 10.3	Seeley Creek, Seeley Creek, N.Y.	2	Monitor for potential water quality impacts

Table 2. Stream Stations Sampled Along the New York-Pennsylvania Border and Sampling Rationale (Continued)

Station	Stream and Location	Monitoring Group	Rationale
SOUT 7.8	South Creek, Fassett, Pa.	2	Monitor for potential water quality impacts
BNTY 0.9	Bentley Creek, Wellsburg, N.Y.	2	Monitor for potential water quality impacts
CHEM 12.0	Chemung River, Chemung, N.Y.	1	Municipal and industrial discharges from Elmira
SUSQ 289.1	Susquehanna River, Sayre, Pa.	1	Large drainage area (4,933 sq. mi.); municipal and industrial discharges

TABLE 3. Stream Stations Sampled Along the Pennsylvania-Maryland Border and Sampling Rationale

Station	Stream and Location	Monitoring Group	Rationale
SBCC 20.4	South Branch Conewago Creek, Bandanna, Pa.	2	Monitor for potential water quality impacts
LNGA 2.5	Long Arm Creek, Bandanna, Pa.	2	Monitor for potential water quality impacts
SUSQ 44.5	Susquehanna River, Marietta, Pa.	1	Bracket hydroelectric dams near the state line
SCTT 3.0	Scott Creek, Delta, Pa.	1	Pollution from untreated sewage
CNWG 4.4	Conowingo Creek, Pleasant Grove, Pa.	1	High nutrient loads and other agricultural runoff; Nonpoint runoff to Chesapeake Bay
OCTO 6.6	Octoraro Creek, Rising Sun, Md.	1	High nutrient loads due to agricultural runoff from New Bridge, Md. Water quality impacts from Octoraro Lake; Nonpoint runoff to Chesapeake Bay
EBAU 1.5	Ebaughs Creek, Stewartstown, Pa.	1	Municipal discharge from Stewartstown; Nonpoint runoff to Chesapeake Bay
DEER 44.5	Deer Creek, Gorsuch Mills, Md.	1	Past pollution from Gorsuch Mills, Md., Stewartstown, Pa.; Nonpoint runoff to Chesapeake Bay
BBDC 4.1	Big Branch Deer Creek, Fawn Grove, Pa.	2	Monitor for potential water quality impacts
FBDC 4.1	Falling Branch Deer Creek, Fawn Grove, Pa.	2	Monitor for potential water quality impacts
SUSQ 10.0	Susquehanna River, Conowingo, Md.	1	Bracket hydroelectric dams near state line.

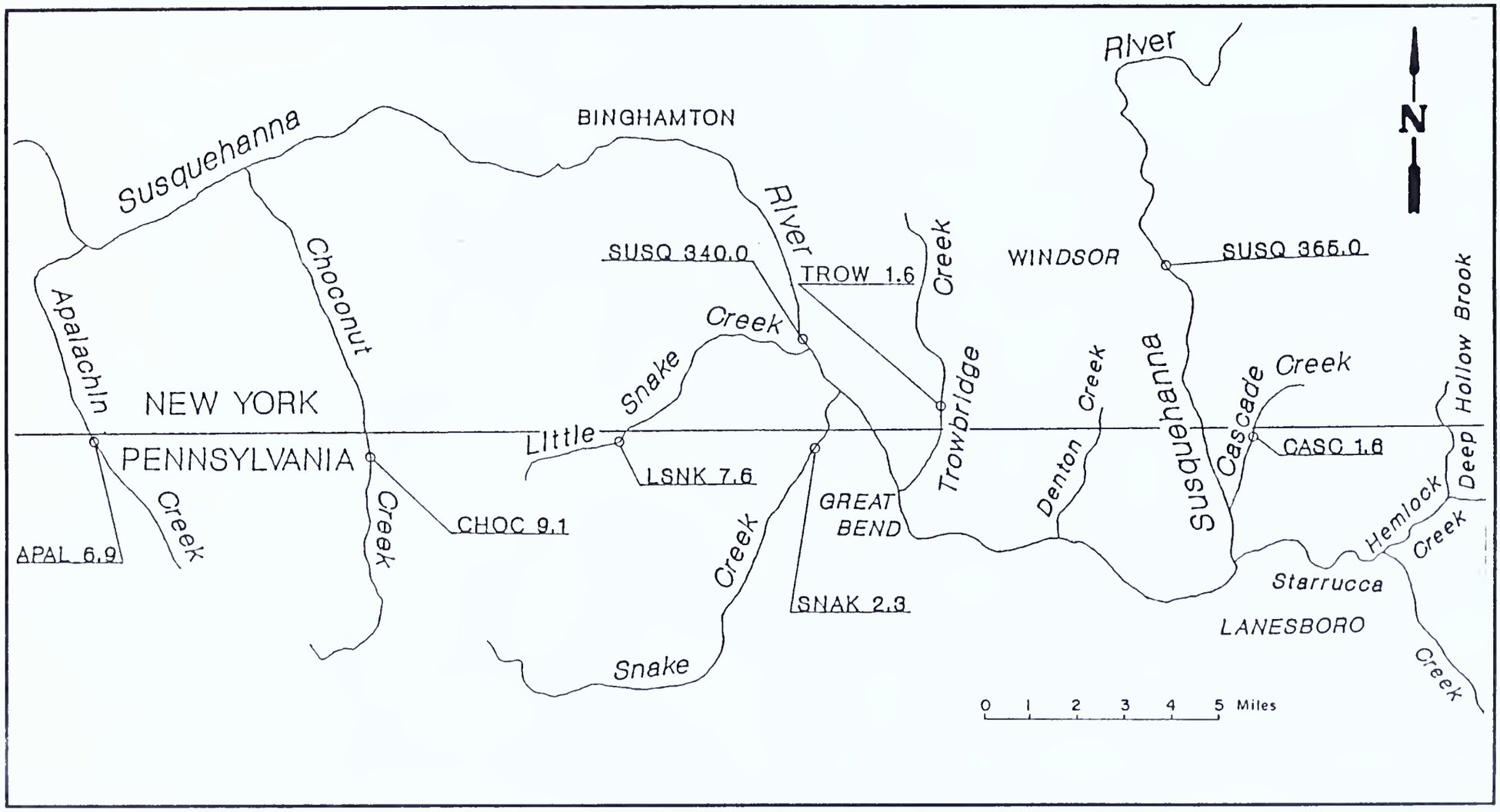


FIGURE 2. Interstate Streams Along the New York-Pennsylvania Border Between Apalachin Creek and Cascade Creek

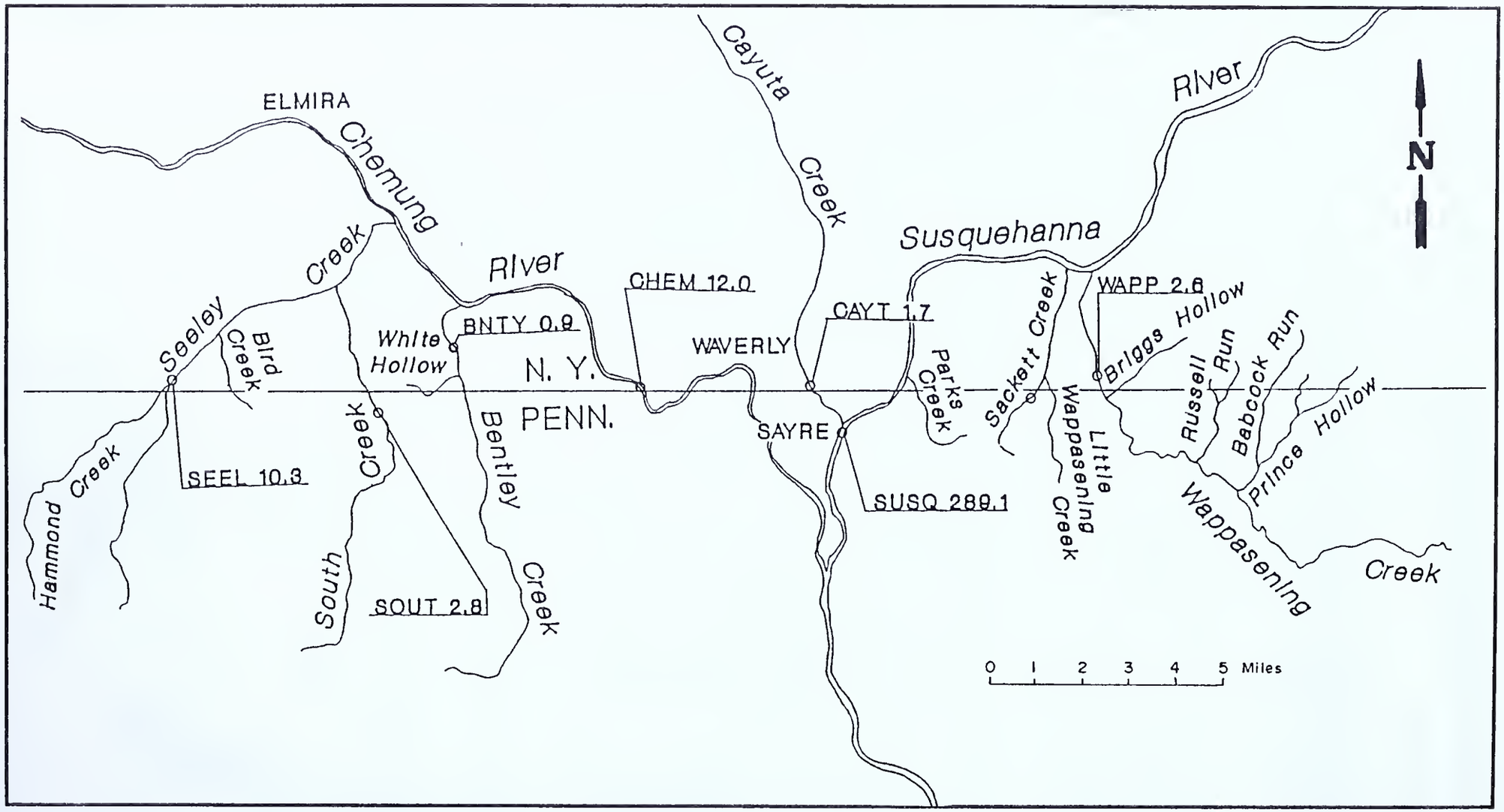


FIGURE 3. Interstate Streams Along the New York-Pennsylvania Border Between Seeley Creek and Wappasening Creek

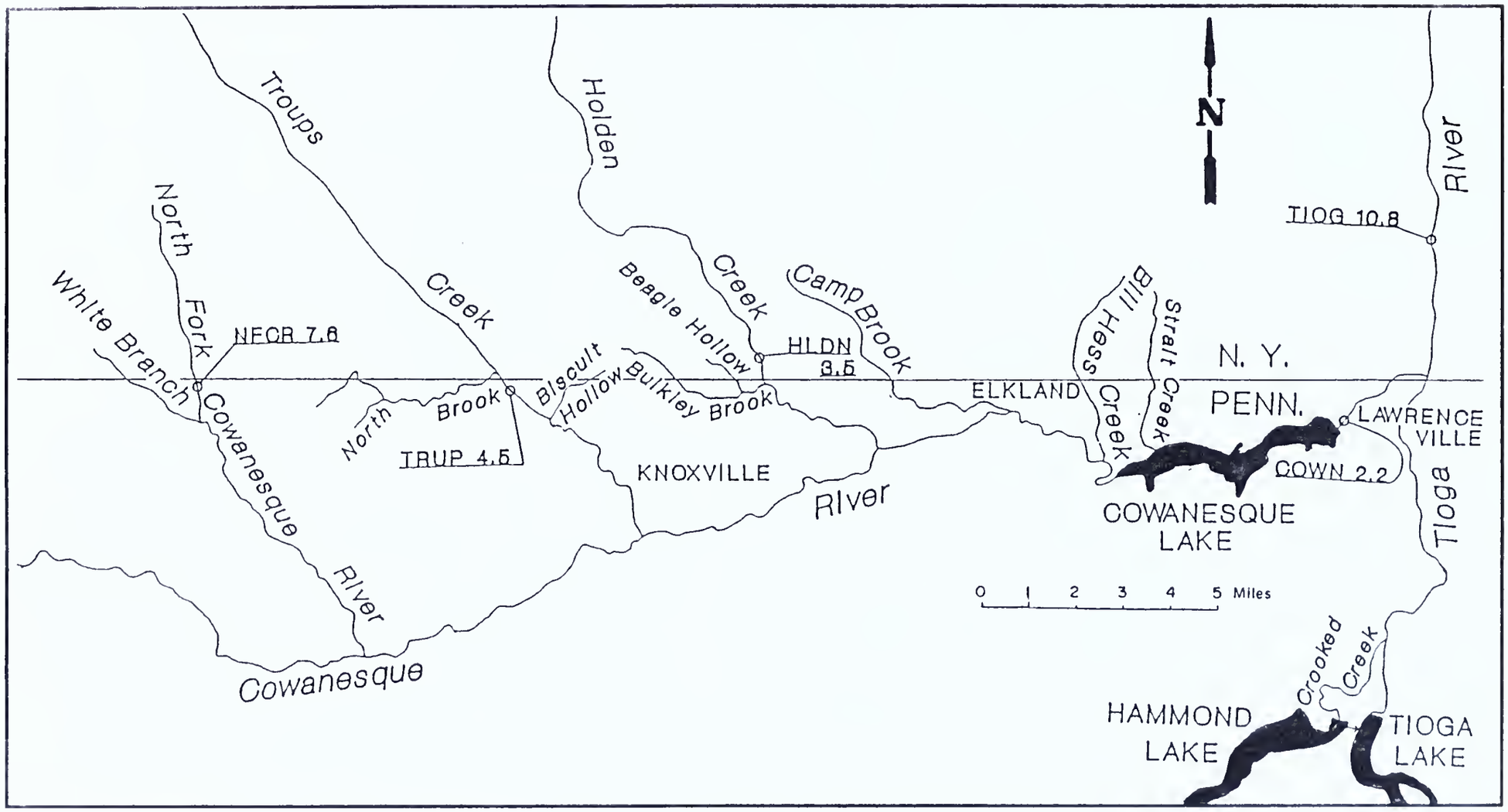


FIGURE 4. Interstate Streams Along the New York-Pennsylvania Border Between North Fork Cowanesque River and Tioga River

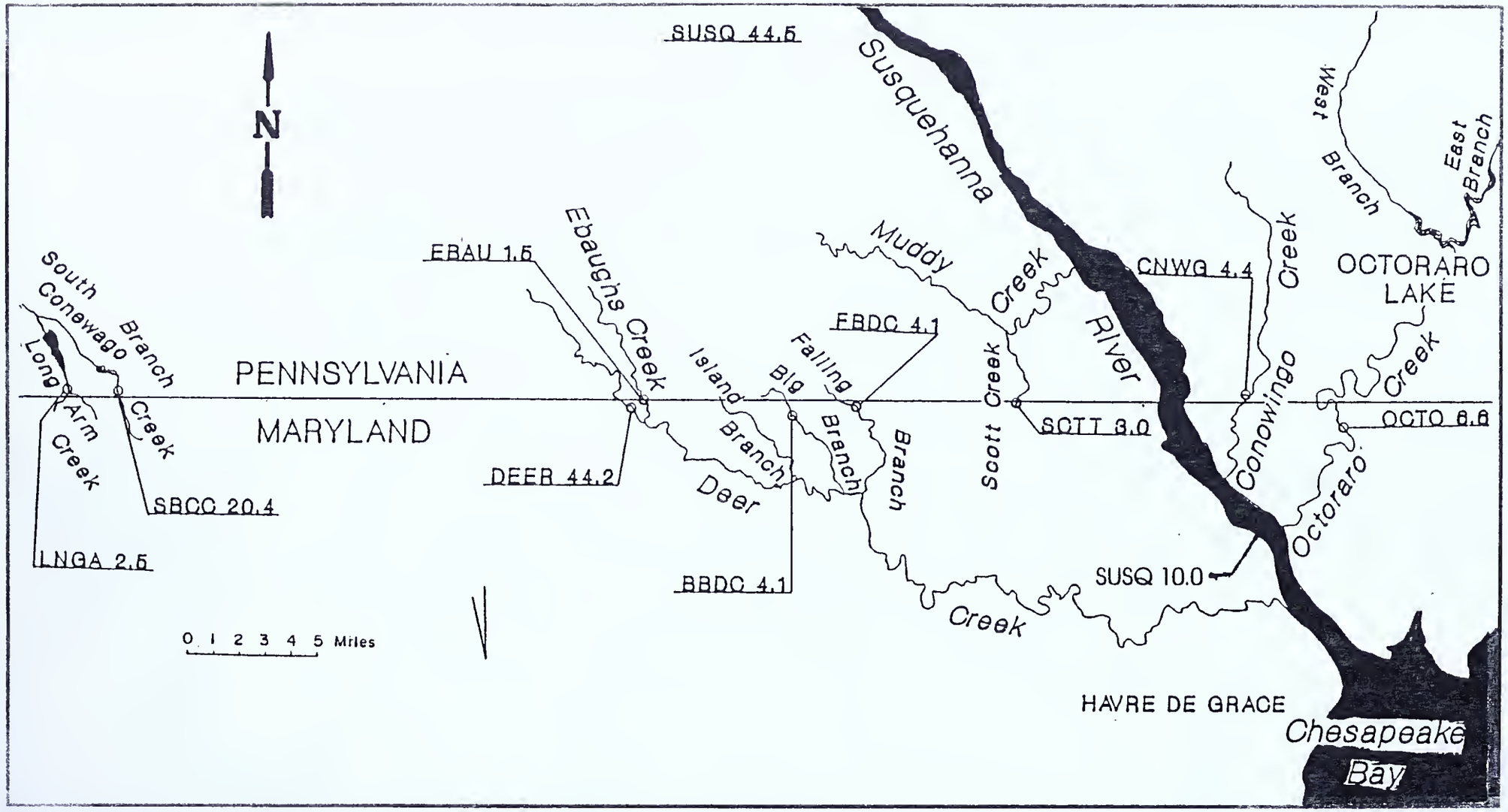


FIGURE 5. Interstate Streams Along the Pennsylvania-Maryland Border

TABLE 4. Monitored Parameters

Parameter		STORET Code
Physical		
Discharge		00060
Temperature		00010
Chemical		
Field Analyses		
Conductivity		00095
Dissolved Oxygen		00300
pH		00400
Alkalinity		00410
Acidity		00435
Free chlorine		50064
Laboratory Analyses		
Biochemical Oxygen Demand		00310
Solids	Dissolved	00515
	Total	00500
Ammonia as Nitrogen	Dissolved	00608
	Total	00610
Nitrite as Nitrogen	Dissolved	00613
	Total	00615
Nitrate as Nitrogen	Dissolved	00618
	Total	00620
Kjeldahl Nitrogen	Dissolved	00623
	Total	00625
Phosphorus	Dissolved	00666
	Total	00665
Orthophosphate	Dissolved	00671
	Total	70507
Organic Carbon	Total	00680
Calcium	Total	00916
Magnesium	Total	00927
Chloride	Total	00940
Sulfate	Total	00945
Iron	Dissolved	01046
	Total	01045
Manganese	Dissolved	01056
	Total	01055
Aluminum	Dissolved	01106
	Total	01105
Turbidity		82079

Composite samples were obtained by collecting eight depth-integrated samples across the stream channel and combining them in a churn splitter that was previously rinsed with distilled water. Sample water was thoroughly mixed in the churn splitter and collected for nutrient analysis in two 500 ml bottles, one filtered and one raw. Samples for metals analysis were collected in two acid-rinsed 500 ml bottles, one filtered and one raw sample. Samples to be used for metals analysis were fixed with 2.0 ml of concentrated nitric acid (HNO3). A cellulose nitrate filter with 0.45 micrometer pore size was used to obtain the filtrate for laboratory analysis. New filter paper was used at each station. The samples were chilled on ice and sent to the Pennsylvania Department of Environmental Resources (Pa. DER), Bureau of Laboratories in Harrisburg, Pa.

Field Chemistry

Temperature, dissolved oxygen, conductivity, pH, alkalinity, acidity, and chlorine were measured in the field. Temperature and dissolved oxygen were measured using a YSI model 54A dissolved oxygen meter. The dissolved oxygen meter was calibrated at the beginning of each day that water samples were collected. A Beckman solu-bridge conductivity meter was used to measure conductivity. An Orion Model 399A meter was used to measure pH. The pH meter was calibrated at the beginning of each day and randomly checked during the day. Alkalinity was determined by titrating a known volume of sample water to pH 4.5 with 0.02 normal sulfuric acid (H2SO4). Acidity was measured by titrating a known volume of sample water to pH 8.3 with 0.02 normal sodium hydroxide (NaOH). Total free chlorine was measured using a Lamotte 4497-DR, Model PC7-DR chlorine test kit.

Macroinvertebrate Sampling

Benthic macroinvertebrates were collected from Group 1 and Group 2 stations between July 22 and August 5, 1993. Macroinvertebrates were sampled to provide an indication of the ecological condition of the stream. Macroinvertebrates are defined as aquatic insects and other invertebrates that are too large to pass through a No. 30 sieve.

Sampling was performed using a one-square-meter kick screen with size No. 30 mesh. The kick screen was stretched across the current, and a hoe was used to dislodge the macroinvertebrates from the substrate. The current carried the dislodged macroinvertebrates into the seine. The macroinvertebrates were washed from the seine and preserved in alcohol for identification in the laboratory. Two kick screen samples were collected at each station.

Data Synthesis

Results of laboratory analyses for chemical parameters were compared to state water quality standards. In addition, a simple water quality index (WQI) was calculated, using procedures established by McMorran (1989). The WQI was used to make comparisons between sampling periods and stations within the same geographical region; therefore, the water quality data were divided into two groups. One group contained stations along the New York-Pennsylvania border and the other group contained stations along the Pennsylvania-Maryland border. The data in each group were sorted by parameter and ranked by increasing order of magnitude. The rank of each chemical analysis was divided by the total number of observations

border. The data in each group were sorted by parameter and ranked by increasing order of magnitude. The rank of each chemical analysis was divided by the total number of observations in the group to obtain a percentile. The WQI score was calculated by averaging all the percentile ranks for each sample. High water quality index scores indicate poor water quality.

Benthic macroinvertebrate samples were assessed using the procedures described in Rapid Bioassessment Protocols for Use in Streams and Rivers (Plafkin and others, 1989). This method calculates a series of biological indices for a stream and compares them to an unimpaired reference station in the same ecoregion to determine the degree of impairment. A high rapid bioassessment protocol score indicates a low degree of impairment and a healthy macroinvertebrate population. The reference stations used for this study are the Susquehanna River at Windsor, N.Y., Little Snake Creek near Brackney, Pa., and the South Branch Conewago Creek near Bandanna, Pa.

RESULTS

The water quality in most interstate streams continues to meet designated use classes and water quality standards. The parameter that most frequently exceeded water quality standards was total iron (Table 5, Figure 6). Only 31 out of a total of 2,784 observations exceeded water quality standards.

Cascade Creek, Trowbridge Creek, Holden Creek, and the North Fork Cowanesque River were not sampled because they were dry.

TABLE 5. Water Quality Standards

Parameter	Number of Observations	Number Exceeding Standards	Standard
Alkalinity	79	2	Pa. aquatic life
Total iron	87	15	N.Y. health (water source)
	87	2	Pa. aquatic life
Dissolved iron	87	2	N.Y. health (water source)
	87	3	Pa. aquatic life
Total manganese	87	2	N.Y. health (water source)
Dissolved manganese	87	2	N.Y. health (water source)
Total Nitrate	87	1	Pa. water supply
Dissolved Nitrate	87	1	Pa. water supply
Dissolved Solids	87	1	N.Y. health (water source)

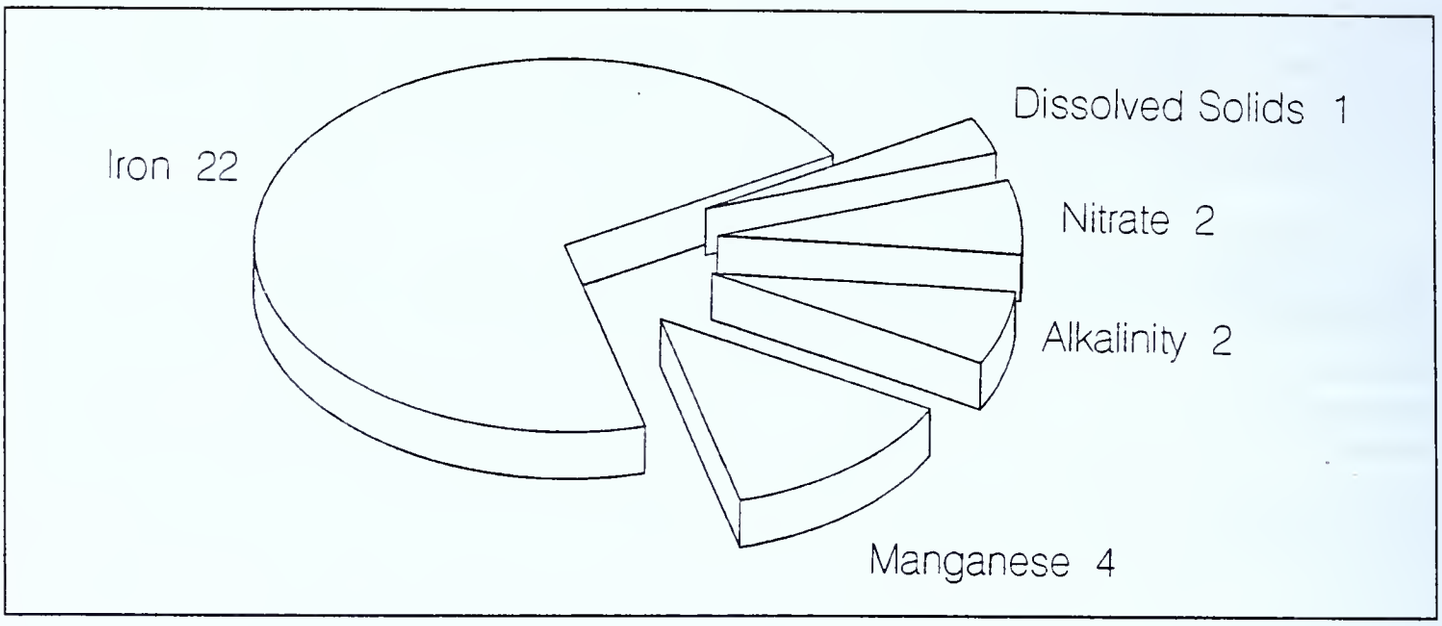


FIGURE 6. Parameters Exceeding Water Quality Standards

New York-Pennsylvania Border Streams

Apalachin Creek shows signs of a slightly to moderately-impaired biological community. Water quality data indicates elevated metals concentrations. Dissolved iron and total iron exceeded water quality standards.

Cayuta Creek continues to be affected by wastewater discharges from the Waverly sewage treatment facility. Elevated nutrient concentrations contribute to high WQI scores and a slightly-impaired macroinvertebrate community. Total iron exceeded water quality standards on three occasions and dissolved solids exceeded standards on one occasion.

Troups Creek at Austinburg, Pa., shows signs of a moderately-impaired biological community. Water quality data do not suggest any possible sources of degradation.

The Cowanesque River below the Cowanesque Reservoir suffers from a severely degraded macroinvertebrate community for the second consecutive year. Increased phytoplankton production in the reservoir causes a shift to a filter feeding community downstream. Chemical data indicates that overall water quality in the Cowanesque River is good. On one occasion total iron exceeded water quality standards.

Acid mine drainage in the headwaters of the Tioga River contributes to poor water quality downstream to the Tioga-Hammond Reservoir. Water quality improves significantly below the Tioga-Hammond Reservoir; however, some impacts from the acid mine drainage may still be detected in the river. The Tioga River supports a healthy non-impaired macroinvertebrate population even though WQI scores indicate elevated concentrations of sulfates and metals. Total iron exceeded water quality standards on one occasion and manganese exceeded standards on four occasions.

For the past five years, the Chemung River has maintained a slightly to moderately-impaired macroinvertebrate population. Elevated nutrient concentrations in the Chemung River indicate wastewater discharges from the city of Elmira, N.Y., may be affecting the biological community. Total iron exceeded standards on one occasion.

Pennsylvania-Maryland Border Streams

Raw sewage discharges from Cardiff, Md., continue to degrade the water quality and macroinvertebrate population in Scott Creek. Nutrient concentrations were high in most of the samples, especially during periods of low stream flows. High streamflows and runoff events appear to dilute the pollutants resulting in lower WQI values. The macroinvertebrate community is moderately- to severely-impaired by the raw sewage discharges and is dominated by pollution tolerant species.

Elevated nutrient concentrations in Conowingo Creek contribute to a slightly-impaired biological community. Agriculture is the most prevalent land use in the watershed, and excess nutrients may enrich the stream. Total and dissolved nitrate concentrations were high throughout the sampling period, and on one occasion total nitrate exceeded water quality standards.

For the third consecutive year, Ebaughs Creek near Stewartstown, Pa., has a slightly- to moderately-impaired macroinvertebrate community. Wastewater discharges from the Stewartstown sewage treatment facility may be affecting the biological community. High WQI scores indicate elevated chloride and nutrient concentrations. Total alkalinity exceeded water quality standards on one occasion.

Octoraro Creek at New Bridge, Md., has a slightly- to moderately-impaired macroinvertebrate population. High WQI values reflect elevated nutrient and metals concentrations. Total iron exceeded water quality standards on two occasions.

A moderately-impaired macroinvertebrate community exists in the Falling Branch of Deer Creek. Water quality data do not suggest any possible sources of degradation.

Station summaries are presented in Tables 6 through 32. The summaries include listings of parameters exceeding water quality standards, WQI values, and parameters that exceeded the 90th percentile at each station. Graphs are provided showing historical comparisons for water quality and biological conditions over the last five years.

ABBREVIATIONS USED IN TABLES 6 THROUGH 34

Abbrev.	Parameter
ALK	Alkalinity
BOD	Biochemical Oxygen Demand
COND	Conductivity
DAl	Dissolved Aluminum
TAl	Total Aluminum
TCa	Total Calcium
TCl	Total Chloride
DFe	Dissolved Iron
TFe	Total Iron
DKN	Dissolved Kjeldahl N
TKN	Total Kjeldahl N
TMg	Total Magnesium
DMn	Dissolved Manganese
TMn	Total Manganese
DNH3	Dissolved Ammonia
TNH3	Total Ammonia
DNO2	Dissolved Nitrite
TNO2	Total Nitrite
DNO3	Dissolved Nitrate
TNO3	Total Nitrate
DO	Dissolved Oxygen
DP	Dissolved Phosphorus
TP	Total Phosphorus
DPO4	Dissolved Orthophosphate
TPO4	Total Orthophosphate
DS	Dissolved Solids
TS	Total Solids
TSO4	Total Sulfate
TOC	Total OrganicCarbon
TURB	Total Turbidity

WQI—Water Quality Index
RBP—Rapid Bioassessment Protocols

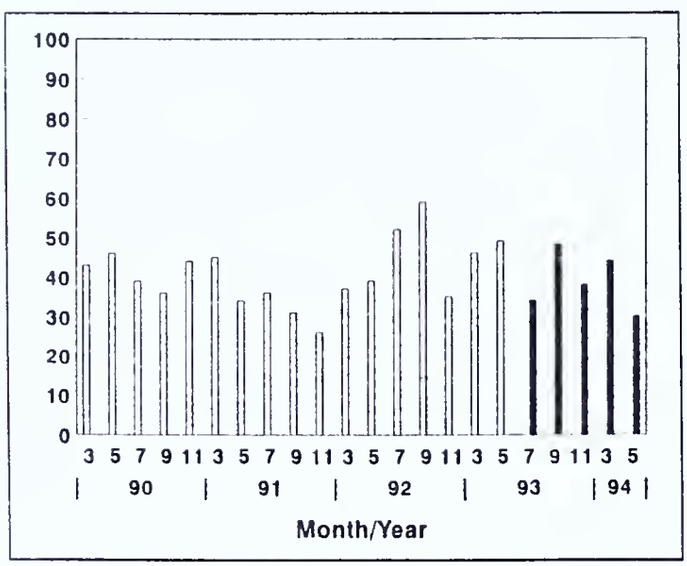
TABLE 6. Water Quality Summary Susquehanna River at Windsor, N.Y.

Parameters Exceeding Standards				
Parameter	**Date**	**Value**	**Standard**	**State**
TFe	11/15/93	314 µg/l	300 µg/l	N.Y. health (water source) and aquatic
TFe	03/14/94	659 µg/l	300 µg/l	N.Y. health (water source) and aquatic

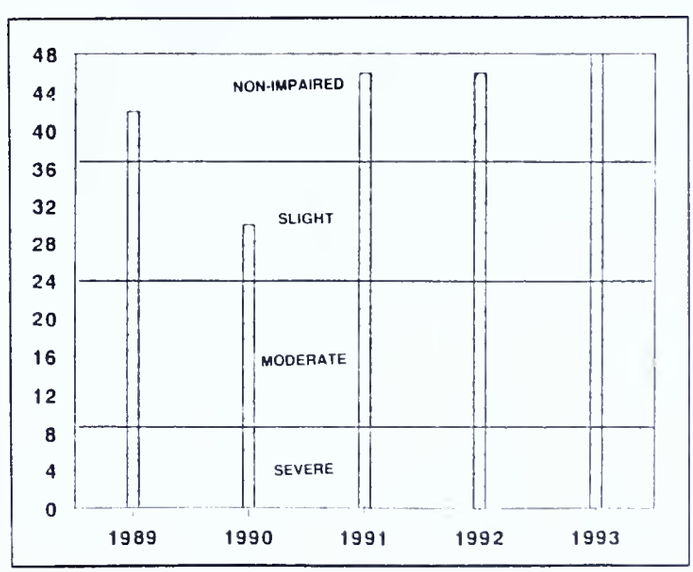
Date	WQI	Parameters Exceeding 90th Percentile							
07/26/93	34								
09/20/93	48	DPO4							
11/15/93	38								
03/14/94	44	TURB							
05/17/94	30								

Biological Summary

Number of taxa: 20
Diversity index: 3.68
RBP score: 48
RBP condition: Reference



Water Quality Index



Biological Index

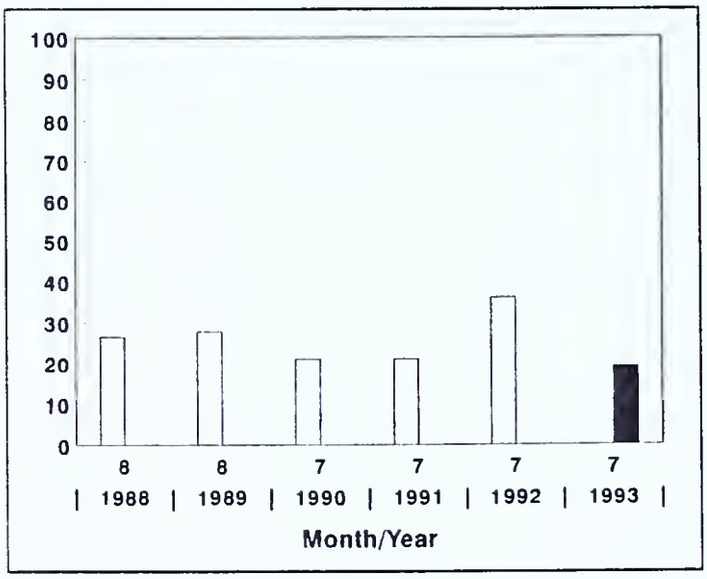
TABLE 7. Water Quality Summary Snake Creek at Brookdale, Pa.

Parameters Exceeding Standards				
Parameter	Date	Value	Standard	State
None				

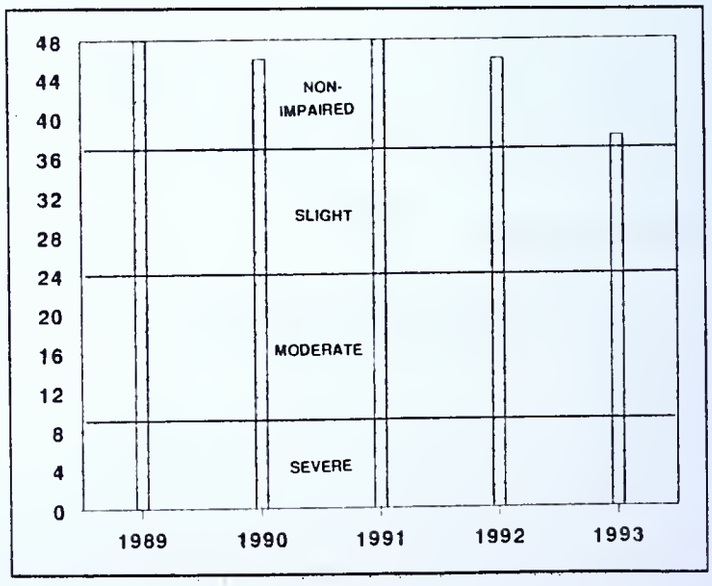
Date	WQI	Parameters Exceeding 90th Percentile							
07/27/93	19								

Biological Summary

Number of taxa: 17
Diversity index: 3.18
RBP score: 38
RBP condition: Slightly impaired



Water Quality Index



Biological Index

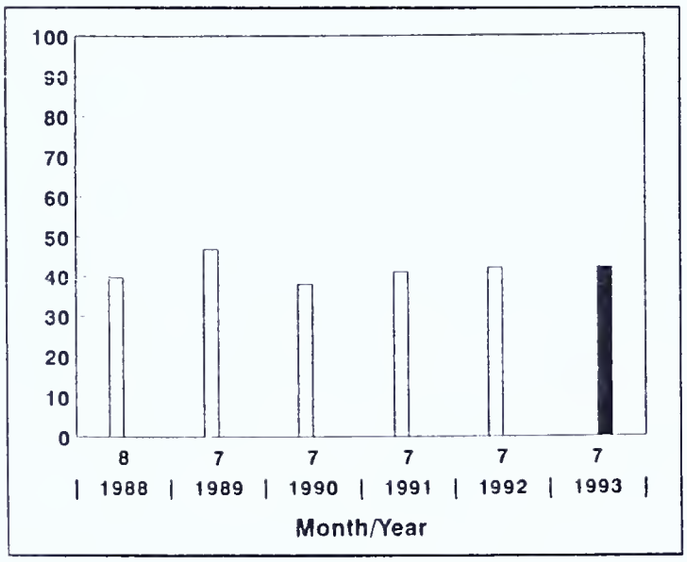
TABLE 8. Water Quality Summary Little Snake Creek at Brackney, Pa.

Parameters Exceeding Standards				
Parameter	**Date**	**Value**	**Standard**	**State**
TFe	07/27/93	489 µg/l	300 µg/l	N.Y. health (water source) and aquatic

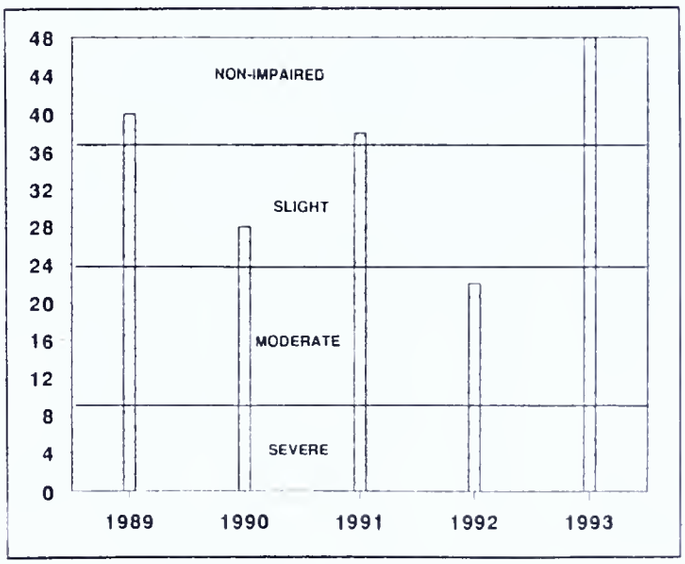
Date	WQI	Parameters Exceeding 90th Percentile							
07/27/93	42	DNH3	DFe						

Biological Summary

Number of taxa: 20
Diversity index: 3.64
RBP score: 48
RBP condition: Reference



Water Quality Index



Biological Index

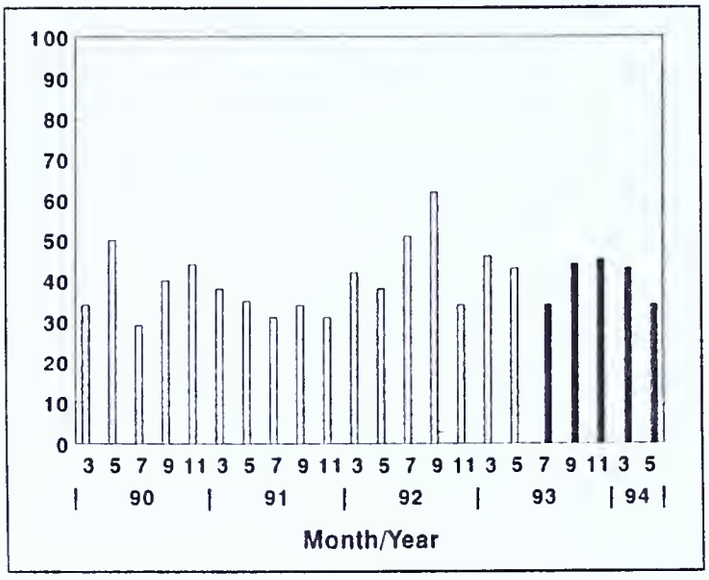
TABLE 9. Water Quality Summary Susquehanna River at Kirkwood, N.Y.

Parameters Exceeding Standards				
Parameter	**Date**	**Value**	**Standard**	**State**
TFe	03/14/93	650 µg/l	300 µg/l	N.Y. health (water source) and aquatic

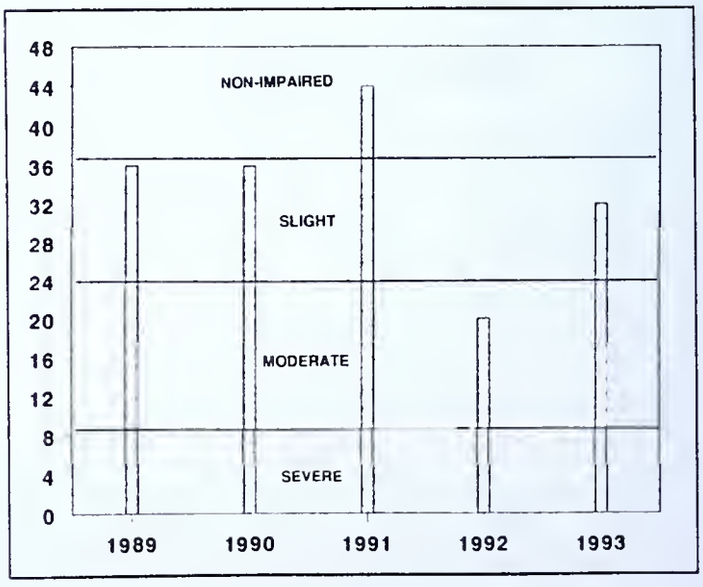
Date	WQI	Parameters Exceeding 90th Percentile							
07/26/93	34								
09/20/93	44	TCa	TMg						
11/15/93	45	DAl							
03/14/94	43	DFe	DAl	TAl					
05/17/94	34	TSO4							

Biological Summary

Number of taxa: 14
Diversity index: 3.01
RBP score: 32
RBP condition: Slightly impaired



Water Quality Index



Biological Index

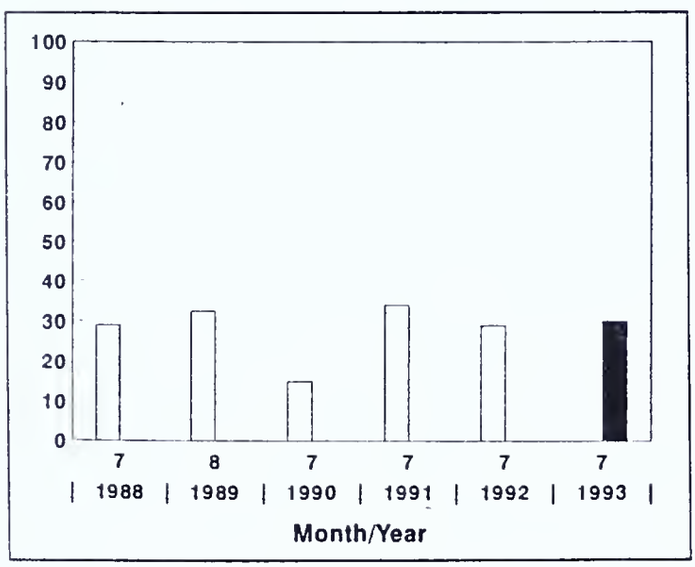
TABLE 10. Water Quality Summary Choconut Creek at Vestal Center, N.Y.

Parameters Exceeding Standards				
Parameter	**Date**	**Value**	**Standard**	**State**
TFe	07/27/93	1,030 µg/l	300 µg/l	N.Y. health (water source) and aquatic
DFe	07/27/93	544 µg/l	300 µg/l	N.Y. health (water source) and aquatic
DFe	07/27/93	544 µg/l	300 µg/l	Pa. water supply and aquatic life

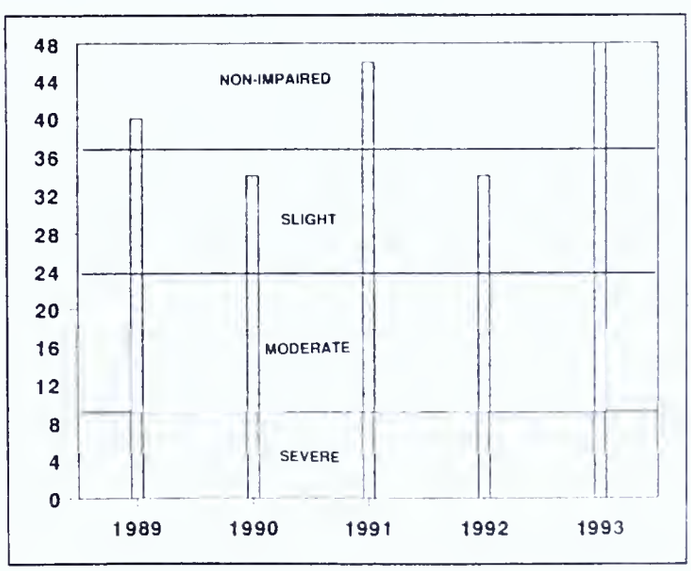
Date	WQI	Parameters Exceeding 90th Percentile							
07/27/93	30	TFe	DFe						

Biological Summary

Number of taxa: 19
Diversity index: 3.46
RBP score: 48
RBP condition: Non-impaired



Water Quality Index



Biological Index

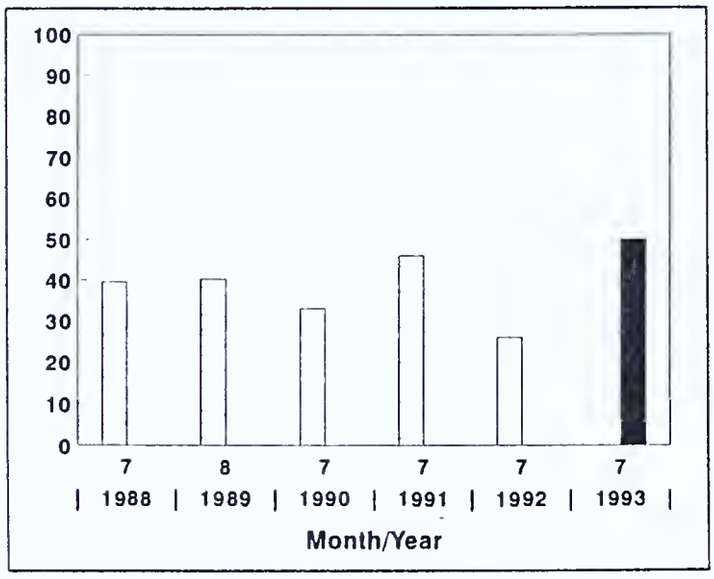
TABLE 11. Water Quality Summary Apalachin Creek at Little Meadows, Pa.

Parameters Exceeding Standards				
Parameter	**Date**	**Value**	**Standard**	**State**
TFe	07/27/93	744 µg/l	300 µg/l	N.Y. health (water source) and aquatic
DFe	07/27/93	302 µg/l	300 µg/l	N.Y. health (water source) and aquatic
DFe	07/27/93	302 µg/l	300 µg/l	Pa. water supply and aquatic life

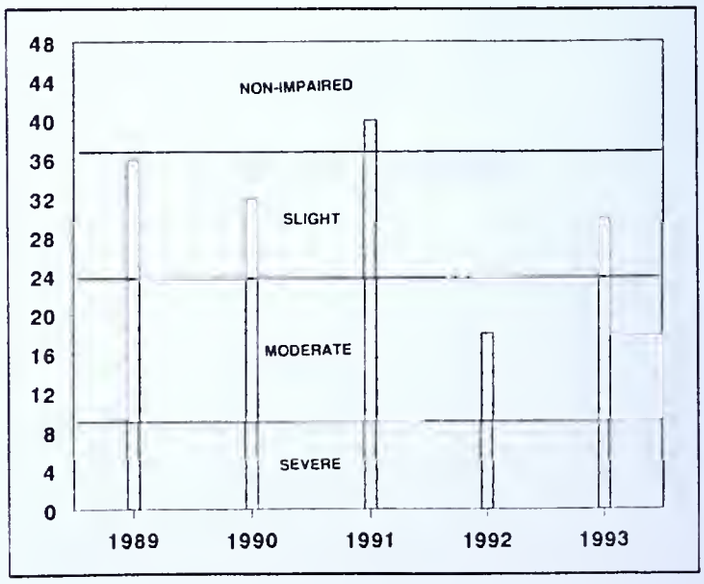
Date	WQI	Parameters Exceeding 90th Percentile							
07/27/93	50	TFe	DFe	TMn	DMn				

Biological Summary

Number of taxa: 12
Diversity index: 2.70
RBP score: 30
RBP condition: Slightly impaired



Water Quality Index



Biological Index

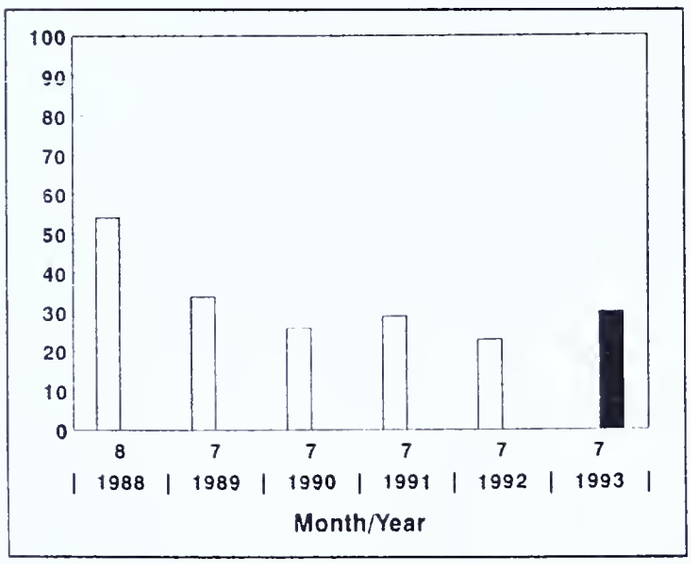
TABLE 12. Water Quality Summary Wappasening Creek at Nichols, N.Y.

Parameters Exceeding Standards				
Parameter	Date	Value	Standard	State
None				

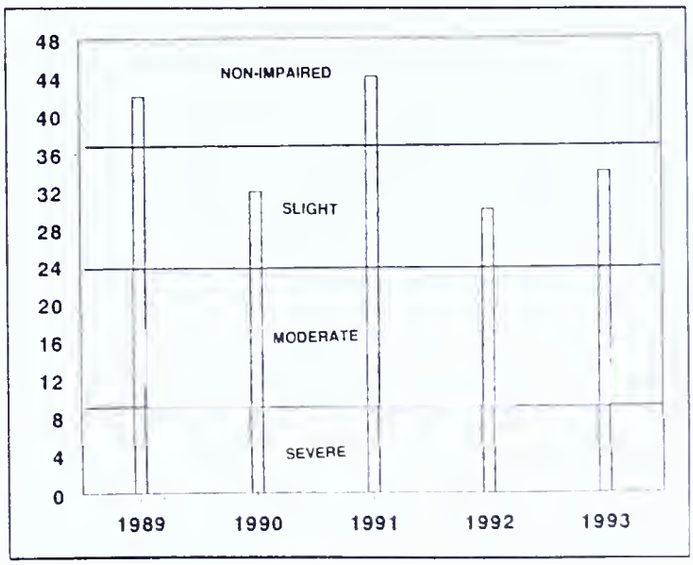
Date	WQI	Parameters Exceeding 90th Percentile							
07/27/93	30								

Biological Summary

Number of taxa: 15
Diversity index: 3.10
RBP score: 34
RBP condition: Slightly impaired



Water Quality Index



Biological Index

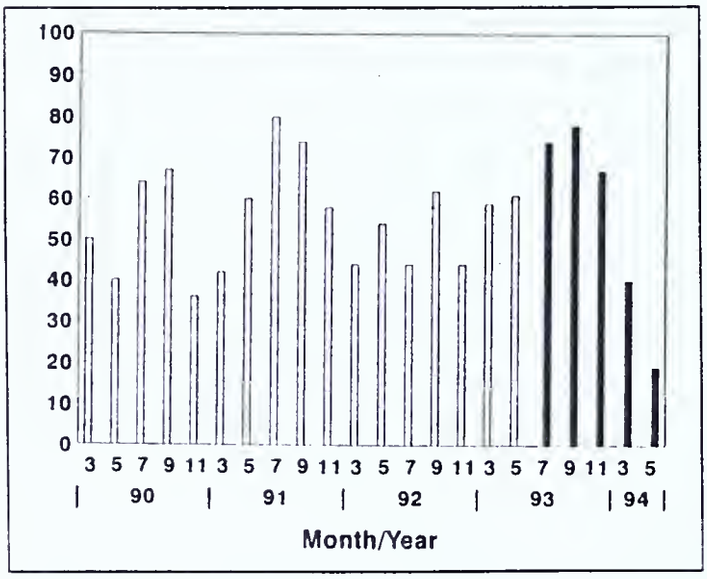
TABLE 13. Water Quality Summary Cayuta Creek at Waverly, N.Y.

Parameters Exceeding Standards				
Parameter	**Date**	**Value**	**Standard**	**State**
DS	09/21/93	550 mg/l	500 mg/l	N.Y. health (water source)
TFe	09/21/93	652 µg/l	300 µg/l	N.Y. health (water source) and aquatic
TFe	11/16/93	348 µg/l	300 µg/l	N.Y. health (water source) and aquatic
TFe	03/14/94	1,430 µg/l	300 µg/l	N.Y. health (water source) and aquatic

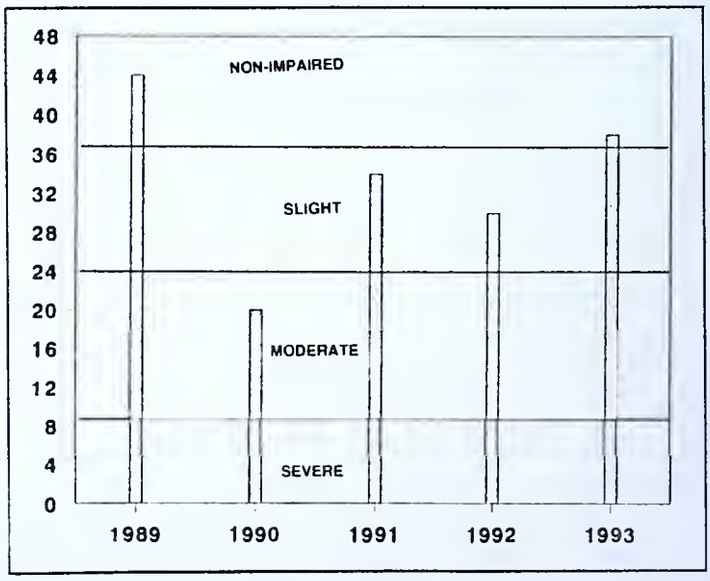
Date	WQI	Parameters Exceeding 90th Percentile							
07/28/93	74	COND	TS	DS	DNO2	TNO2	DNO3	TNO3	DKN
		TKN	DP	TP	DOP	TOP	TCa	TCl	
09/21/93	78	COND	TS	DS	TNO2	DNO3	TNO3	DKN	TKN
		DP	TP	DOP	TOP	TOC	TCa	TMg	TCl
11/16/93	67	DNO3	TNO3	DP	TP	DOP	TOP		
03/14/94	40	TURB	TFe	TAl					
05/17/94	19								

Biological Summary

Number of taxa: 20
Diversity index: 3.31
RBP score: 38
RBP condition: Slightly impaired



Water Quality Index



Biological Index

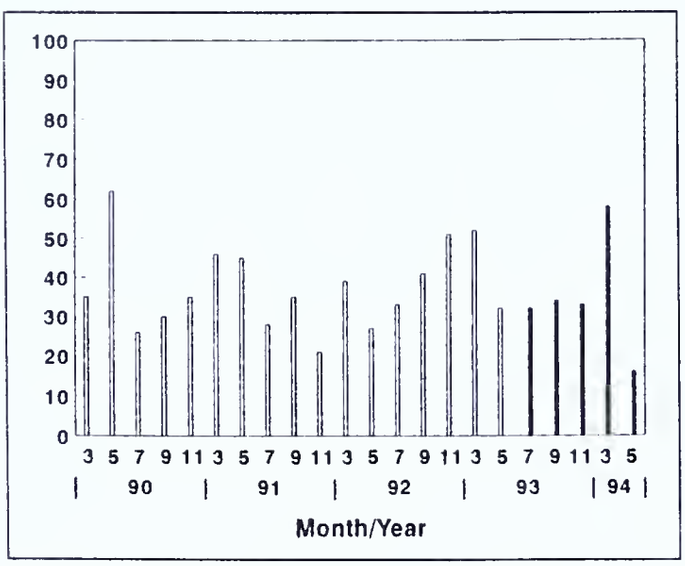
TABLE 14. Water Quality Summary Troups Creek at Austinburg, Pa.

Parameters Exceeding Standards				
Parameter	**Date**	**Value**	**Standard**	**State**
TFe	11/17/93	364 µg/l	300 µg/l	N.Y. health (water source) and aquatic
TFe	03/15/94	1,380 µg/l	300 µg/l	N.Y. health (water source) and aquatic

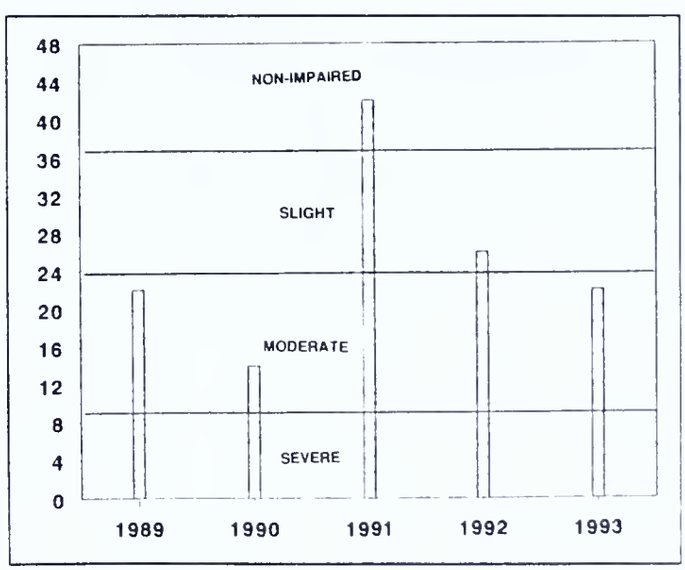
Date	WQI	Parameters Exceeding 90th Percentile							
07/29/93	32								
09/22/93	34								
11/17/93	33								
03/15/94	58	TURB	DFe	TFe	DAl	TAl			
05/18/94	16								

Biological Summary

Number of taxa: 11
Diversity index: 2.17
RBP score: 22
RBP condition: Moderately impaired



Water Quality Index



Biological Index

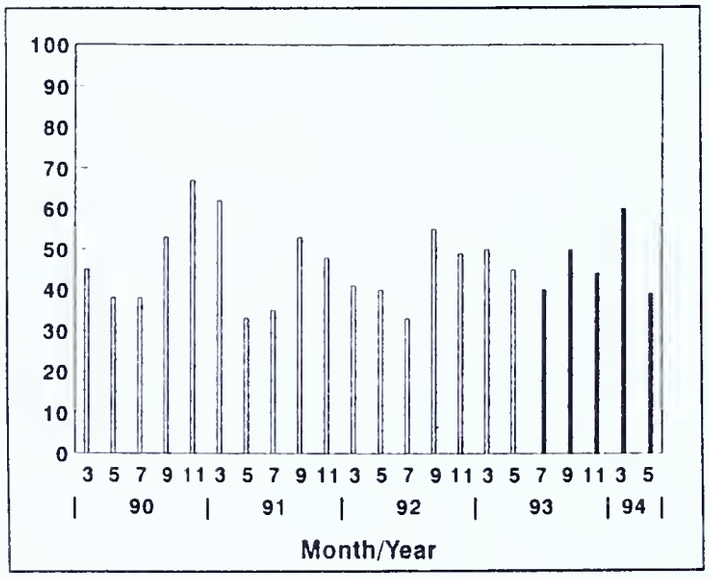
TABLE 15. Water Quality Summary Cowanesque River at Lawrenceville, Pa.

Parameters Exceeding Standards				
Parameter	**Date**	**Value**	**Standard**	**State**
TFe	03/15/94	419 µg/l	300 µg/l	N.Y. health (water source) and aquatic

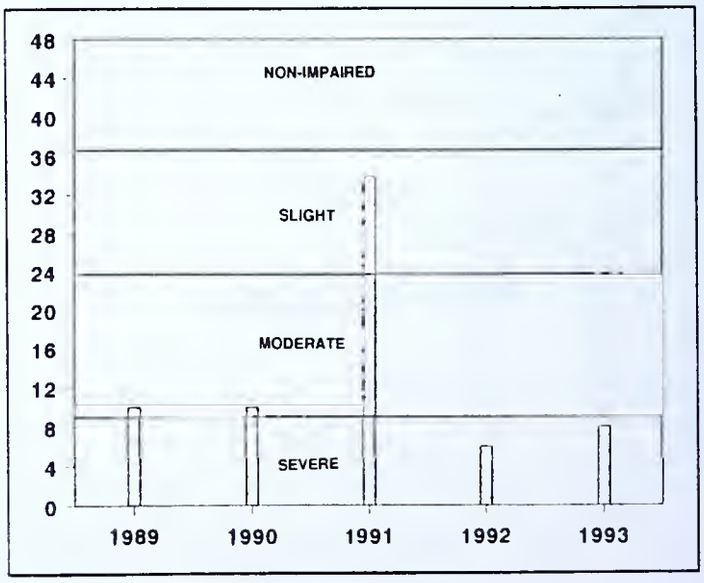
Date	WQI	Parameters Exceeding 90th Percentile							
07/27/93	40								
09/22/93	50								
11/17/93	44	DNH3	TNH3	DMn					
03/15/94	60	DNO3	TNO3	DAl	TAl				
05/18/94	39	BOD	DKN	TOC					

Biological Summary

Number of taxa: 6
Diversity index: 0.99
RBP score: 8
RBP condition: Severely impaired



Water Quality Index



Biological Index

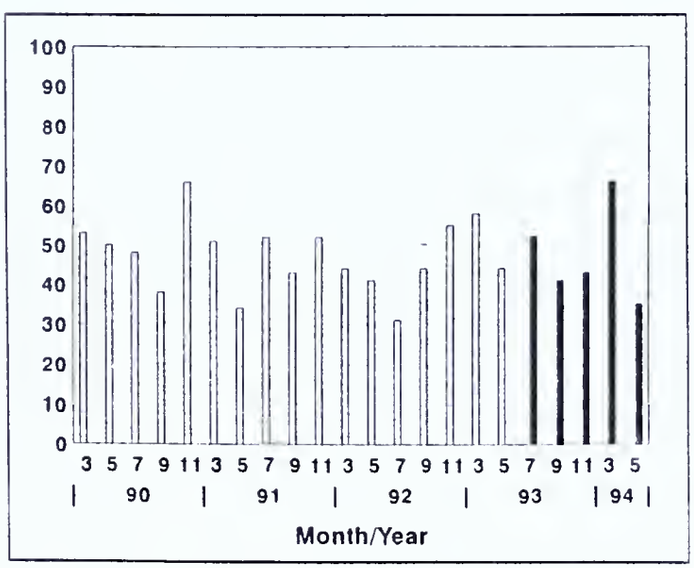
TABLE 16. Water Quality Summary Tioga River at Lindley, N.Y.

Parameters Exceeding Standards				
Parameter	**Date**	**Value**	**Standard**	**State**
DMn	11/17/93	801 µg/l	300 µg/l	N.Y. health (water source)
TMn	11/17/93	913 µg/l	300 µg/l	N.Y. health (water source)
TFe	03/15/94	528 µg/l	300 µg/l	N.Y. health (water source) and aquatic
DMn	05/18/94	340 µg/l	300 µg/l	N.Y. health (water source)
TMn	05/18/94	423 µg/l	300 µg/l	N.Y. health (water source)

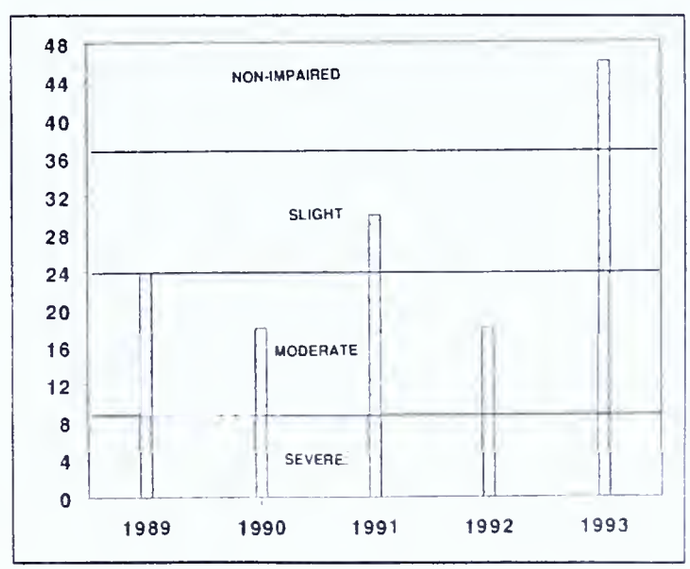
Date	WQI	Parameters Exceeding 90th Percentile							
07/27/93	52	TSO4							
09/21/93	41	TSO4							
11/17/93	43	DNH3	TSO4	DMn	TMn				
03/15/94	66	DNH3	TNO2	DNO3	TNO3	DMn	TMn		
05/18/94	35	DMn	TMn						

Biological Summary

Number of taxa: 17
Diversity index: 3.32
RBP score: 46
RBP condition: Non-impaired



Water Quality Index



Biological Index

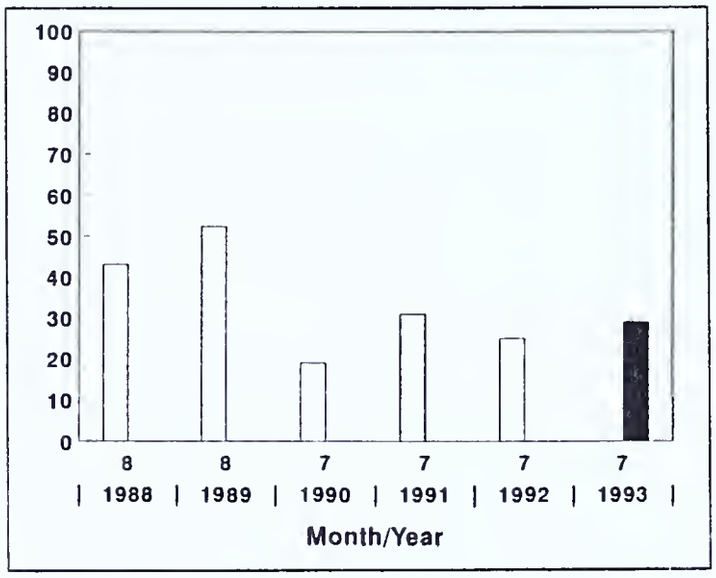
TABLE 17. Water Quality Summary Seeley Creek at Seeley Creek, N.Y.

Parameters Exceeding Standards				
Parameter	Date	Value	Standard	State
None				

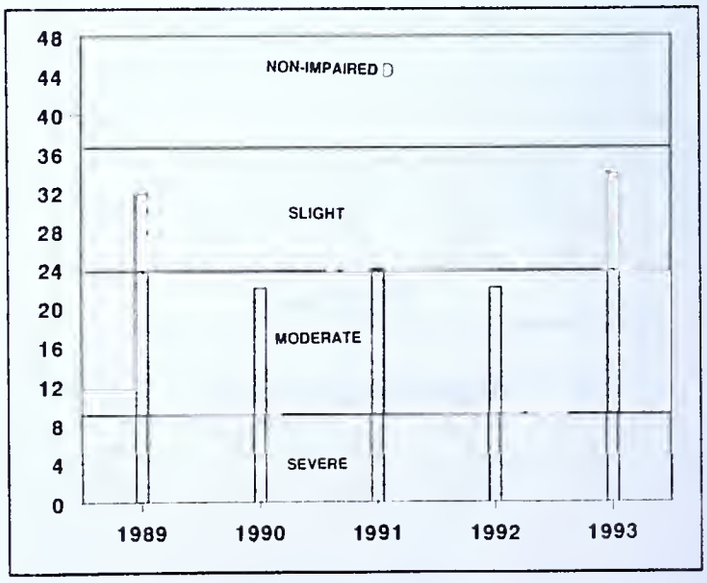
Date	WQI	Parameters Exceeding 90th Percentile							
07/28/93	29	TCa							

Biological Summary

Number of taxa: 12
Diversity index: 3.13
RBP score: 34
RBP condition: Slightly impaired



Water Quality Index



Biological Index

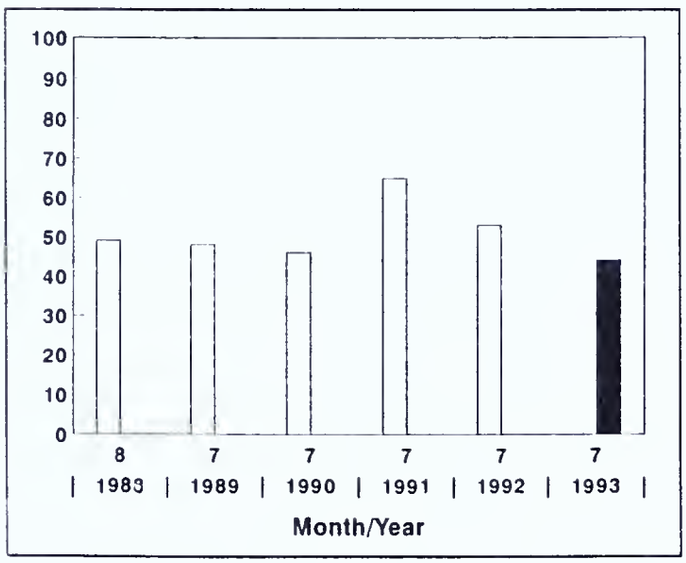
TABLE 18. Water Quality Summary South Creek at Fassett, Pa.

Parameters Exceeding Standards				
Parameter	Date	Value	Standard	State
None				

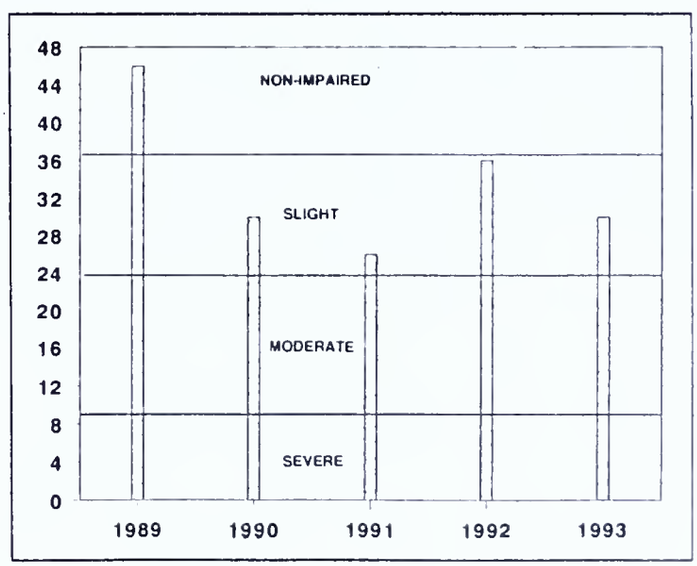
Date	WQI	Parameters Exceeding 90th Percentile							
07/28/93	44	TOC							

Biological Summary

Number of taxa: 14
Diversity index: 2.79
RBP score: 30
RBP condition: Slightly impaired



Water Quality Index



Biological Index

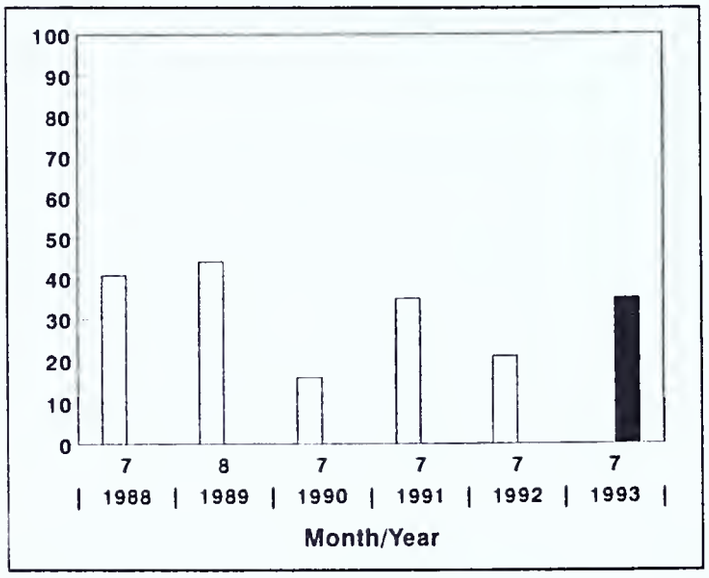
TABLE 19. Water Quality Summary Bentley Creek at Wellsburg, N.Y.

Parameters Exceeding Standards				
Parameter	Date	Value	Standard	State
None				

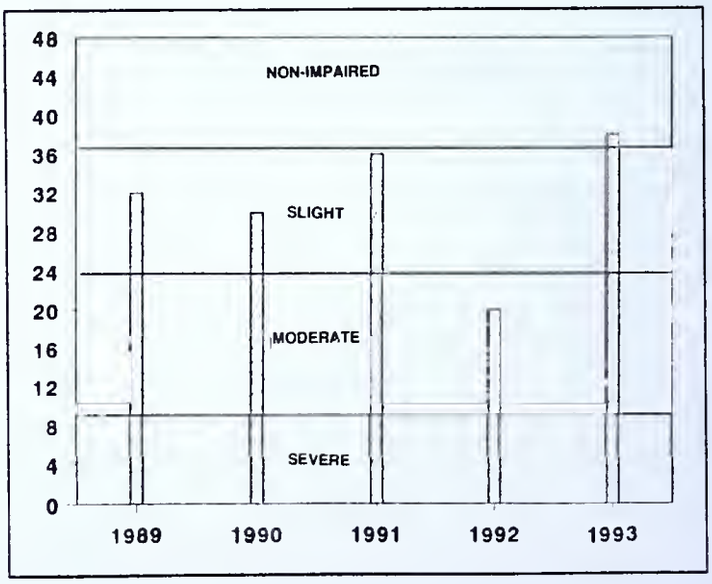
Date	WQI	Parameters Exceeding 90th Percentile							
07/28/93	35								

Biological Summary

Number of taxa: 15
Diversity index: 2.92
RBP score: 38
RBP condition: Slightly impaired



Water Quality Index



Biological Index

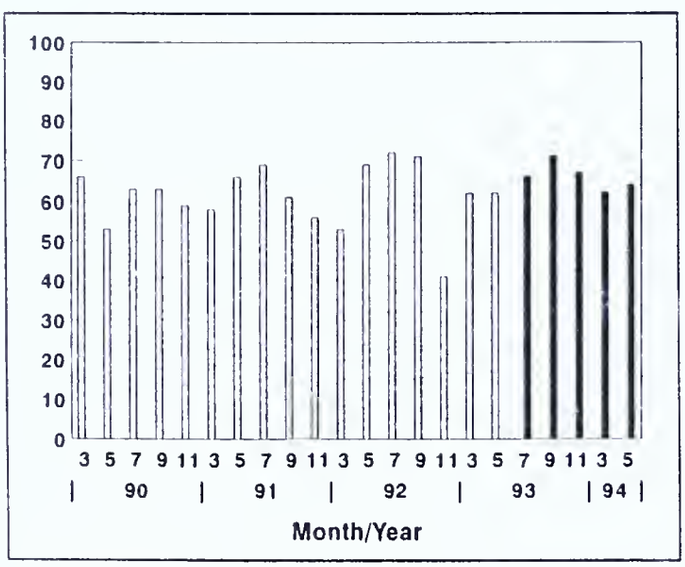
TABLE 20. Water Quality Summary Chemung River at Chemung, N.Y.

Parameters Exceeding Standards				
Parameter	**Date**	**Value**	**Standard**	**State**
TFe	03/14/94	602 μg/l	300 μg/l	N.Y. health (water source) and aquatic

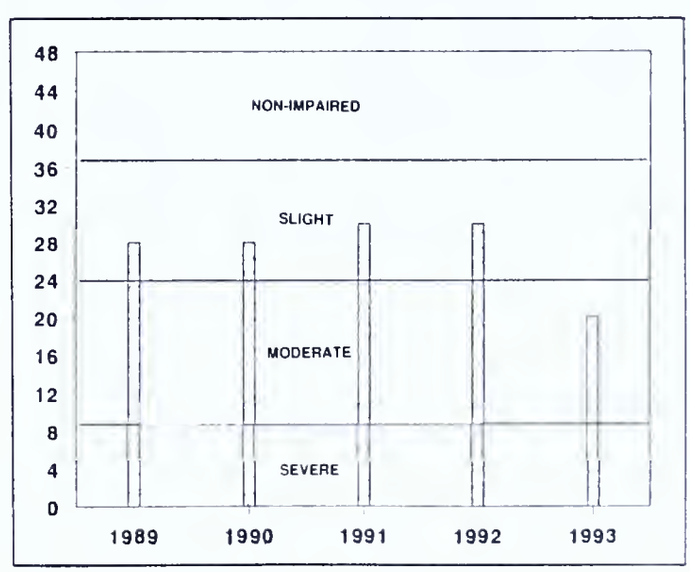
Date	WQI	Parameters Exceeding 90th Percentile							
07/28/93	66	COND	BOD	TS	DKN	TKN	TP	TOC	TMg
		TCl	TMn						
09/21/93	71	COND	TS	DP	TP	TOP	TCa	TMg	TCl
11/16/93	67	COND	TS	TMg	TCl				
03/14/94	62	TNO2	TURB						
05/18/94	64	BOD	DKN	TKN	TOC				

Biological Summary

Number of taxa: 10
Diversity index: 2.45
RBP score: 20
RBP condition: Moderately impaired



Water Quality Index



Biological Index

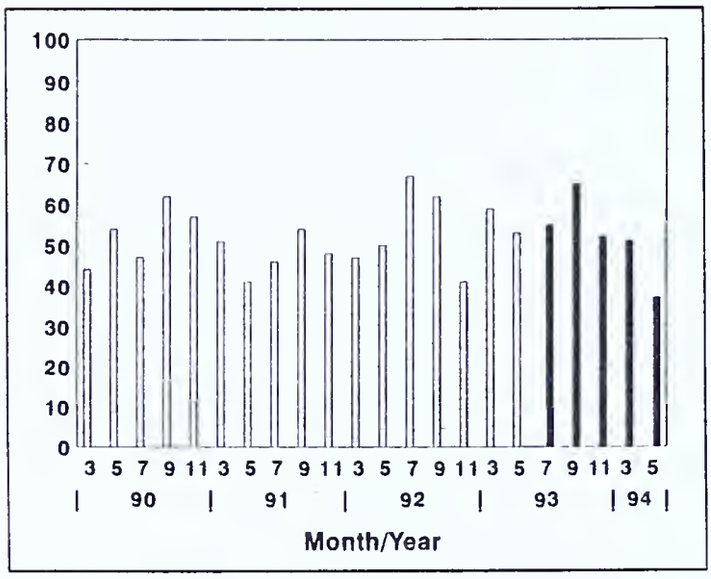
TABLE 21. Water Quality Summary Susquehanna River at Sayre, Pa.

Parameters Exceeding Standards				
Parameter	**Date**	**Value**	**Standard**	**State**
TFe	03/14/94	722 µg/l	300 µg/l	N.Y. health (water source) and aquatic

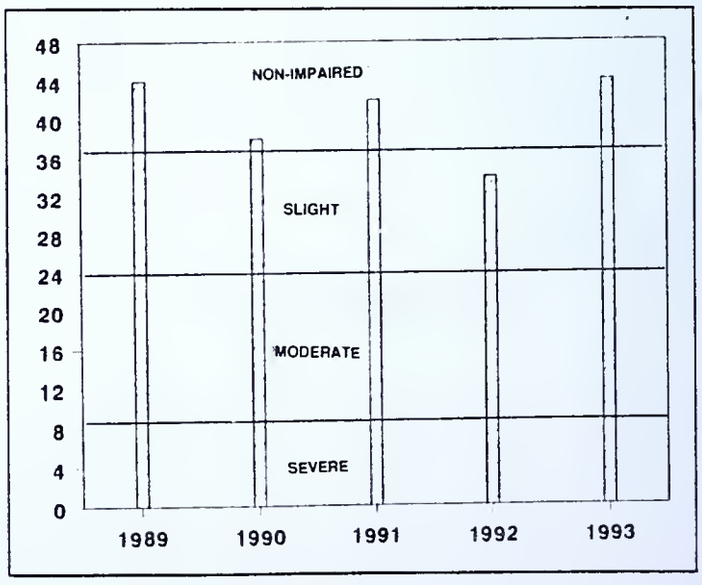
Date	WQI	Parameters Exceeding 90th Percentile							
07/27/93	55	TKN							
09/21/93	65	TNO2	DP	DPO4	TPO4				
11/16/93	52	DAl							
03/14/94	51	DNH3	TURB	TFe	TAl				
05/17/94	37	DNO2							

Biological Summary

Number of taxa: 19
Diversity index: 3.52
RBP score: 44
RBP condition: Non-impaired



Water Quality Index



Biological Index

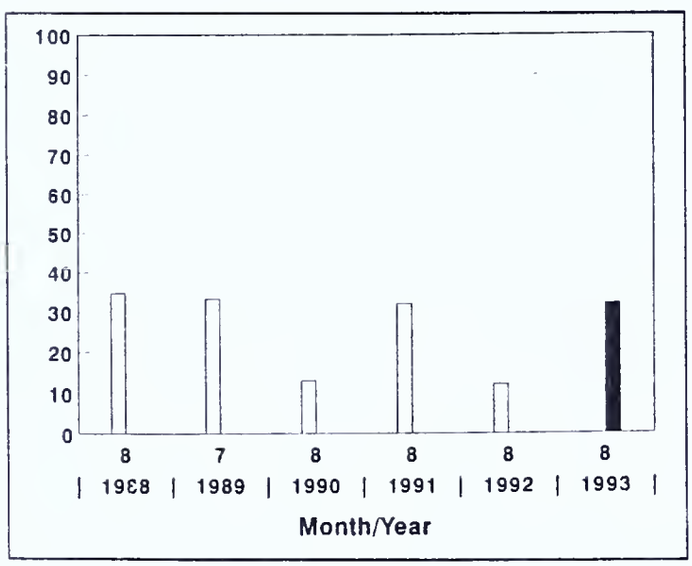
TABLE 22. Water Quality Summary South Branch Conewago Creek at Bandanna, Pa.

Parameters Exceeding Standards				
Parameter	Date	Value	Standard	State
None				

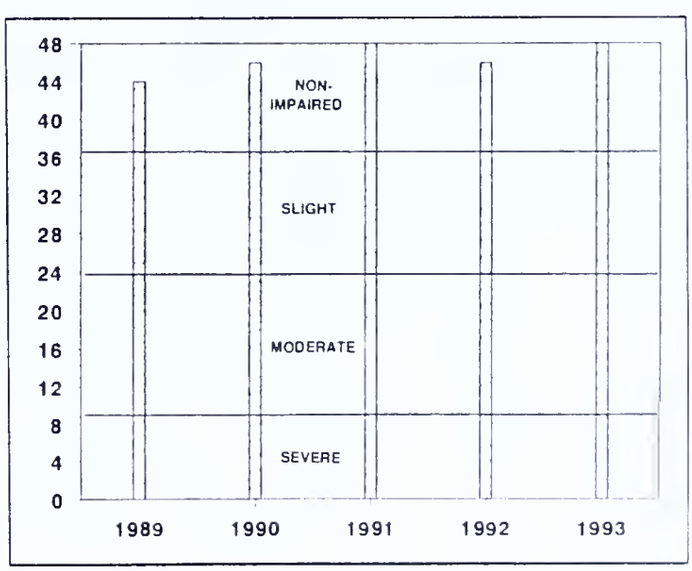
Date	WQI	Parameters Exceeding 90th Percentile							
08/02/93	32								

Biological Summary

Number of taxa: 25
Diversity index: 4.18
RBP score: 48
RBP condition: Reference



Water Quality Index



Biological Index

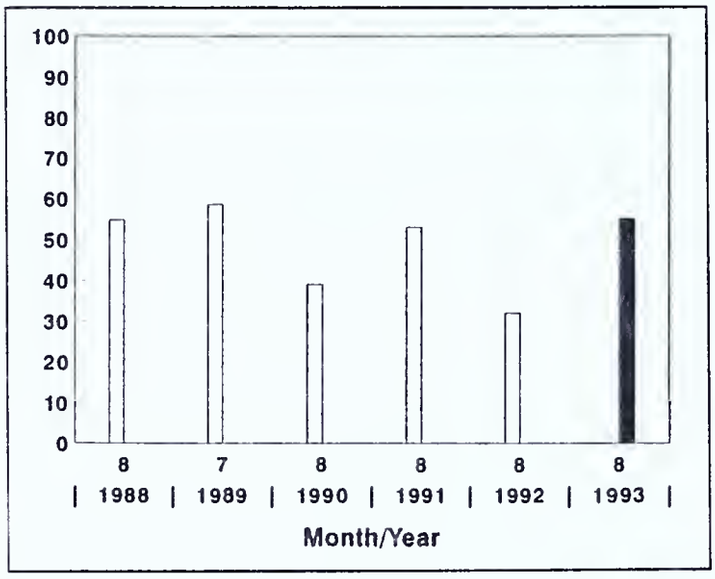
TABLE 23. Water Quality Summary Long Arm Creek at Bandanna, Pa.

Parameters Exceeding Standards				
Parameter	Date	Value	Standard	State
None				

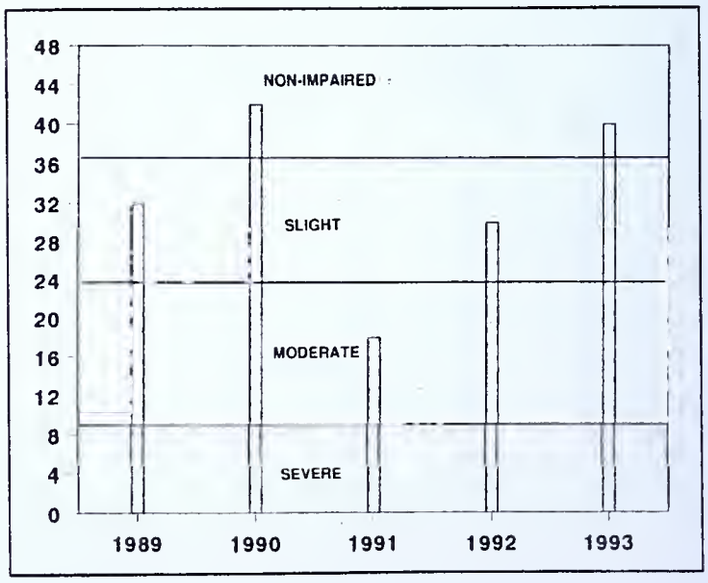
Date	WQI	Parameters Exceeding 90th Percentile							
08/02/93	55	DNO3	TNO3	TCa	TMg	DMn	TMn		

Biological Summary

Number of taxa: 21
Diversity index: 3.57
RBP score: 40
RBP condition: Non-impaired



Water Quality Index



Biological Index

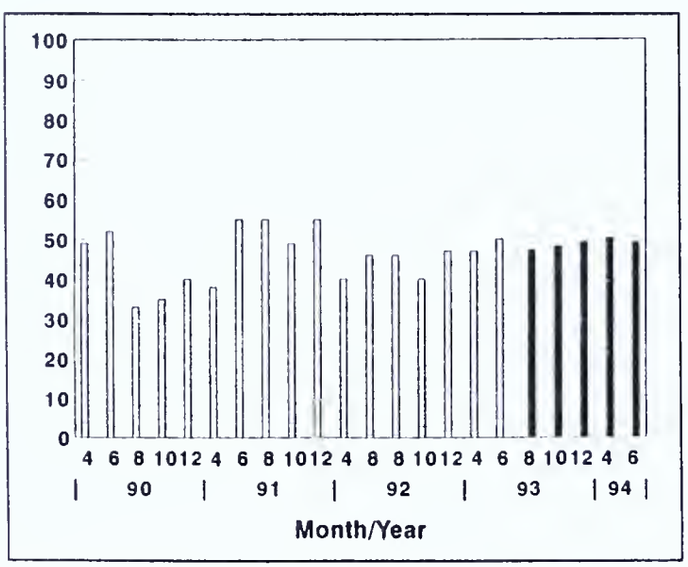
TABLE 24. Water Quality Summary Susquehanna River at Marietta, Pa.

Parameters Exceeding Standards				
Parameter	**Date**	**Value**	**Standard**	**State**
DFe	10/21/93	488 µg/l	300 µg/l	Pa. water supply and aquatic life

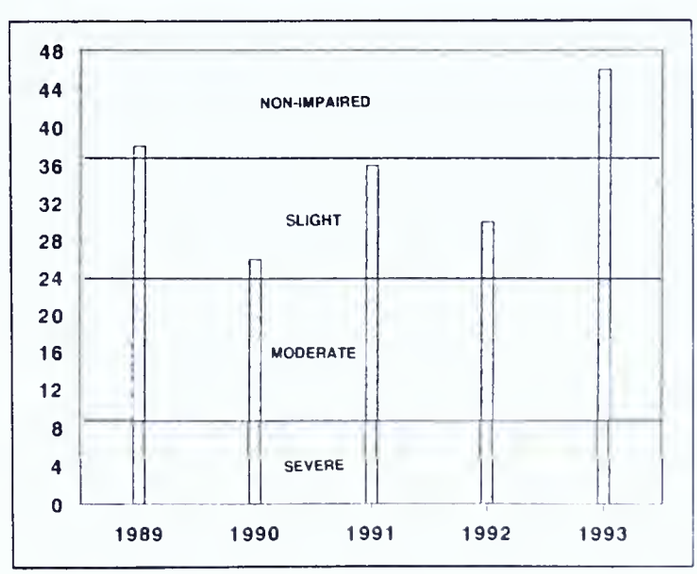
Date	WQI	Parameters Exceeding 90th Percentile							
08/05/93	47	COND	BOD	TS	TCa	TMg	TSO4		
10/21/93	48	TS	DS	TCa	TSO4	DFe			
12/16/93	49	BOD	TS	TMn					
04/21/94	50	TURB	TFe						
06/15/94	49	BOD	TSO4	TURB	TMn				

Biological Summary

Number of taxa: 23
Diversity index: 3.73
RBP score: 46
RBP condition: Non-impaired



Water Quality Index



Biological Index

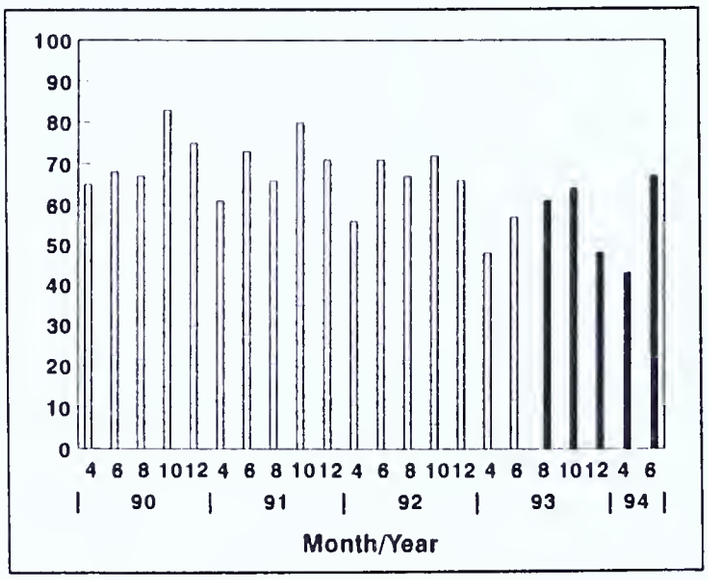
TABLE 25. Water Quality Summary Scott Creek at Delta, Pa.

Parameters Exceeding Standards				
Parameter	Date	Value	Standard	State
None				

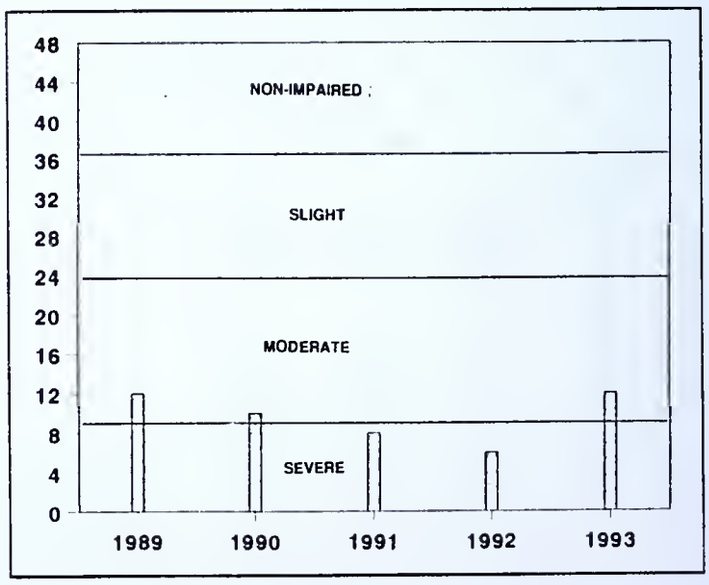
Date	WQI	Parameters Exceeding 90th Percentile							
08/04/93	61	COND	DS	DPO4	TPO4	TMg			
10/19/93	64	COND	DP	DPO4	TMg				
12/14/93	48	TFe							
04/19/94	43								
06/13/94	67	DNH3	TNH3	DNO2	TNO2	DP	TP	DPO4	

Biological Summary

Number of taxa: 10
Diversity index: 2.16
RBP score: 12
RBP condition: Moderately impaired



Water Quality Index



Biological Index

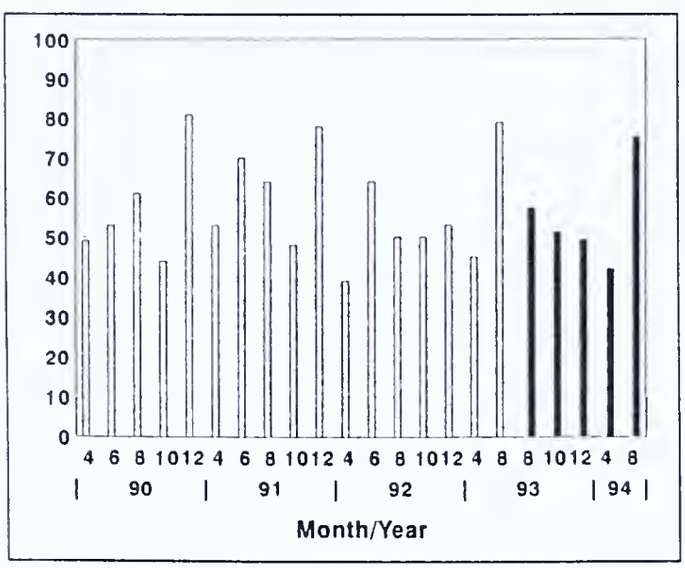
TABLE 26. Water Quality Summary Conowingo Creek at Pleasant Grove, Pa.

Parameters Exceeding Standards				
Parameter	**Date**	**Value**	**Standard**	**State**
DNO3	10/20/93	16.7 mg/l	10.0 mg/l	Pa. water supply
TNO3	10/20/93	16.9 mg/l	10.0 mg/l	Pa. water supply

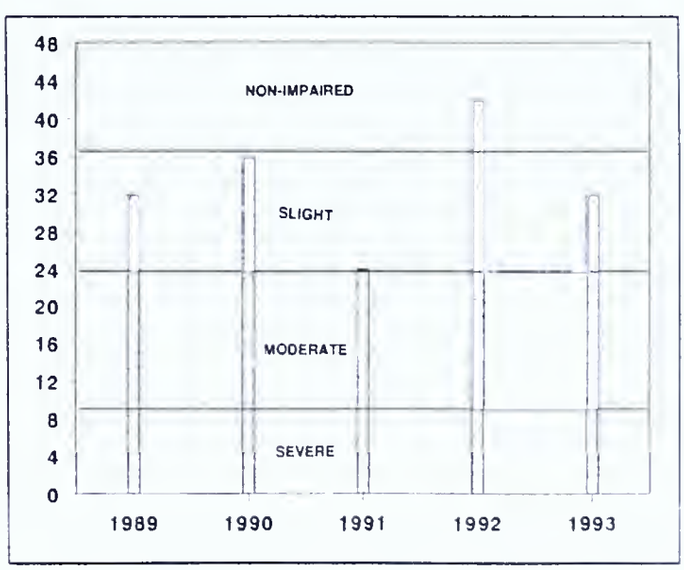
Date	WQI	Parameters Exceeding 90th Percentile							
08/05/93	57	DNO3	TNO3						
10/20/93	51	DNO3	TNO3						
12/15/93	49	DAl							
04/20/94	42	DNO3	TNO3						
06/14/94	75	BOD	DNO2	TNO2	TKN	TP	TPO4	TOC	TURB
		TFe	TAl						

Biological Summary

Number of taxa: 15
Diversity index: 3.12
RBP score: 32
RBP condition: Slightly impaired



Water Quality Index



Biological Index

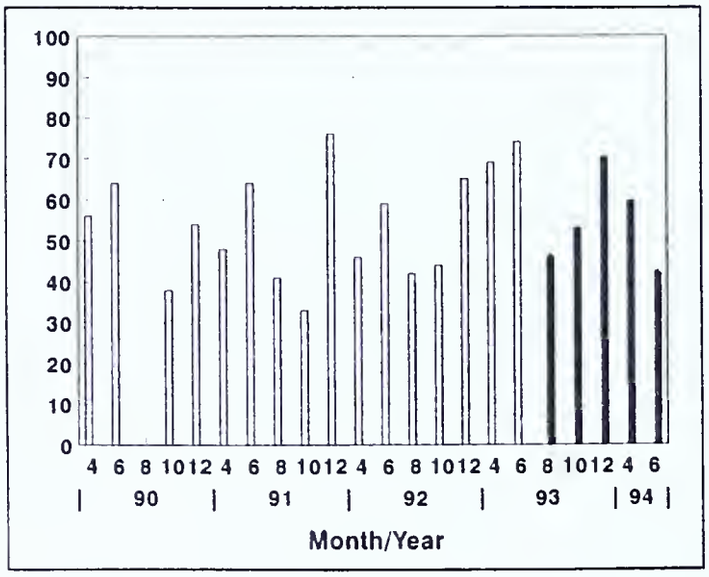
TABLE 27. Water Quality Summary Octoraro Creek at Rising Sun, Md.

Parameters Exceeding Standards				
Parameter	**Date**	**Value**	**Standard**	**State**
TFe	12/15/93	2,170 µg/l	1,500 µg/l	Pa. water supply and aquatic life
TFe	04/20/93	4,170 µg/l	1,500 µg/l	Pa. water supply and aquatic life

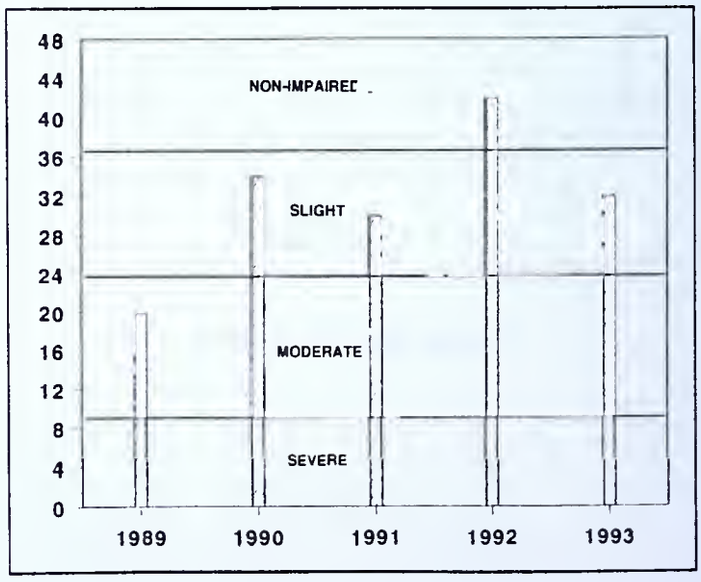
Date	WQI	Parameters Exceeding 90th Percentile							
08/04/93	46								
10/20/93	53	TKN	DP	TOC					
12/15/93	70	DNH3	TNH3	DKN	TKN	DP	TP	DPO4	TPO4
		TOC	TURB	DFe	TFe	DAl	TAl		
04/20/94	60	TFe	DMn						
06/14/94	42								

Biological Summary

Number of taxa: 17
Diversity index: 3.28
RBP score: 32
RBP condition: Slightly impaired



Water Quality Index



Biological Index

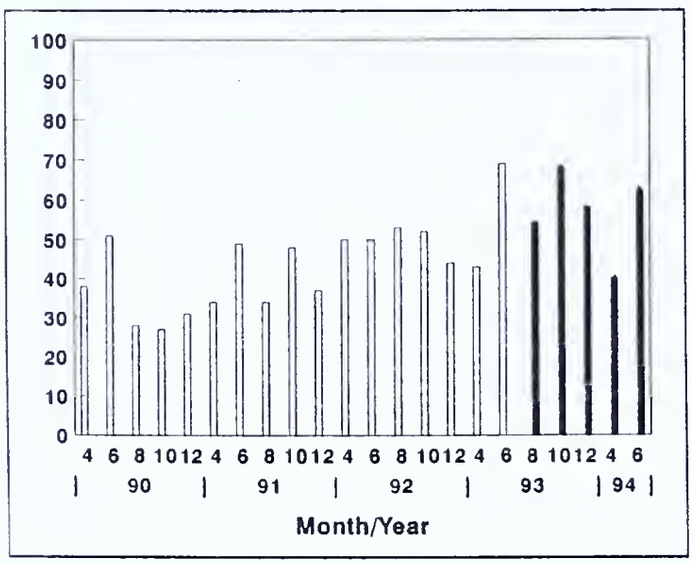
TABLE 28. Water Quality Summary Ebaughs Creek at Stewartstown, Pa.

Parameters Exceeding Standards				
Parameter	**Date**	**Value**	**Standard**	**State**
ALK	12/14/93	18 mg/l	20 mg/l	Pa. aquatic life

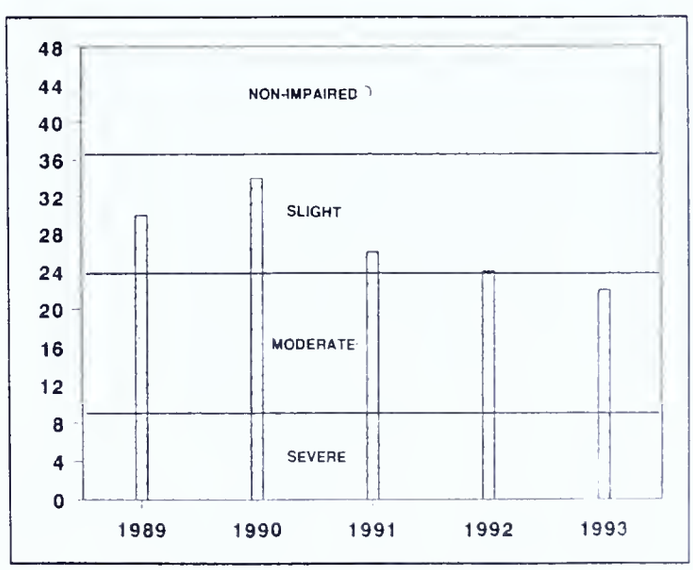
Date	WQI	Parameters Exceeding 90th Percentile							
08/03/93	54								
10/19/93	68	COND	TS	DS	DKN	TKN	TCa	TCl	
12/14/93	58	TCl							
04/19/94	40	DNH3	TNH3	TCl					
06/13/94	62	DS	DNO2	TNO2	DKN	TCl	DFe		

Biological Summary

Number of taxa: 13
Diversity index: 2.77
RBP score: 22
RBP condition: Moderately impaired



Water Quality Index



Biological Index

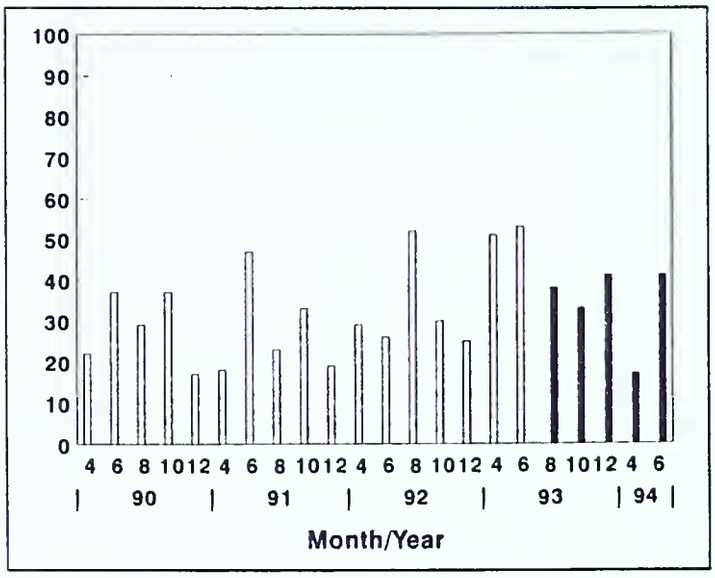
TABLE 29. Water Quality Summary Deer Creek at Gorsuch Mills, Md.

Parameters Exceeding Standards				
Parameter	Date	Value	Standard	State
None				

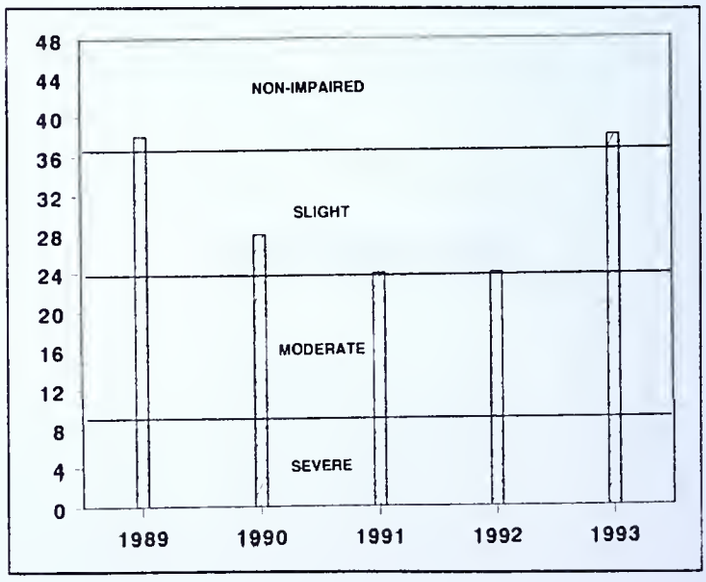
Date	WQI	Parameters Exceeding 90th Percentile							
08/03/93	38								
10/19/93	33	DAl							
12/14/93	41	TP	TPO4	DAl					
04/19/94	17								
06/13/94	41								

Biological Summary

Number of taxa: 18
Diversity index: 3.54
RBP score: 38
RBP condition: Slightly impaired



Water Quality Index



Biological Index

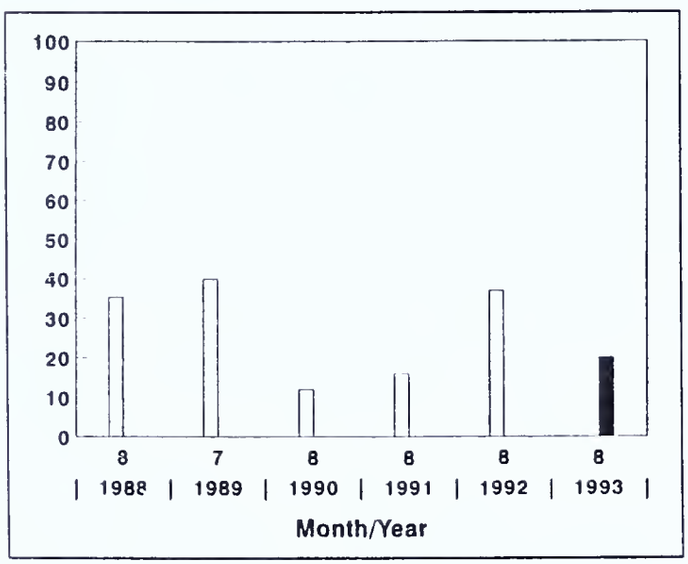
TABLE 30. Water Quality Summary Big Branch Deer Creek at Fawn Grove, Pa.

Parameters Exceeding Standards				
Parameter	Date	Value	Standard	State
ALK	08/03/93	14 mg/l	20 mg/l	Pa. aquatic life

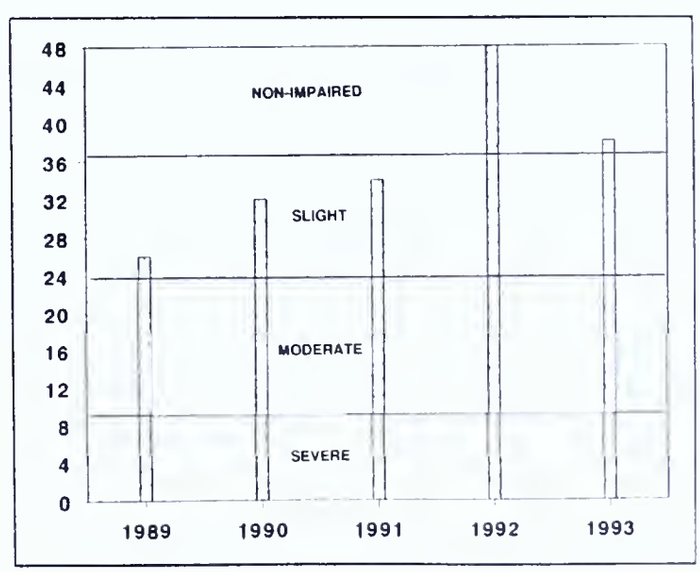
Date	WQI	Parameters Exceeding 90th Percentile							
08/03/93	20								

Biological Summary

Number of taxa: 22
Diversity index: 3.47
RBP score: 38
RBP condition: Slightly impaired



Water Quality Index



Biological Index

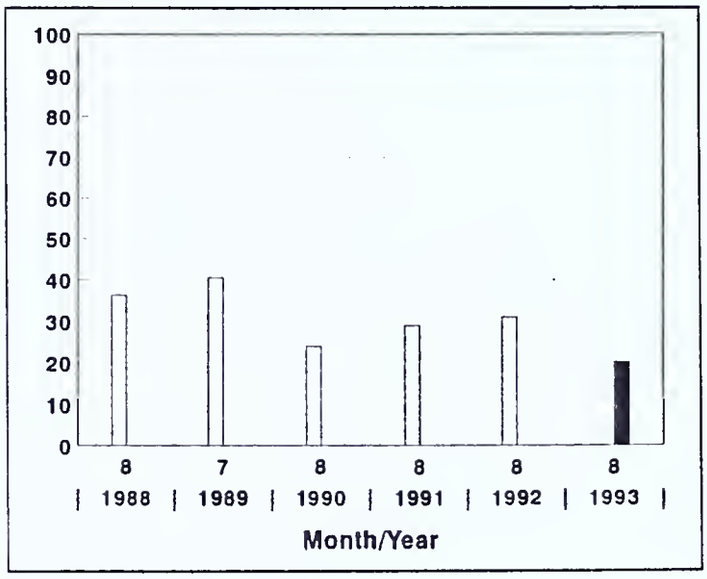
TABLE 31. Water Quality Summary Falling Branch Deer Creek at Fawn Grove, Pa.

Parameters Exceeding Standards				
Parameter	Date	Value	Standard	State
None				

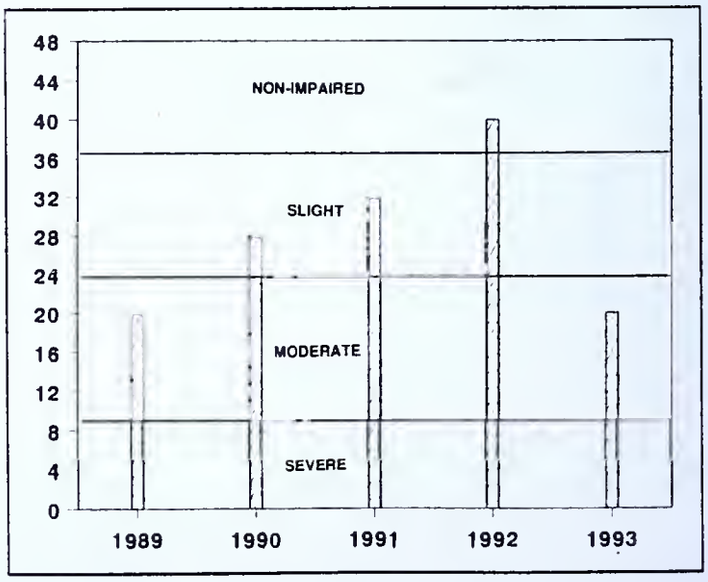
Date	WQI	Parameters Exceeding 90th Percentile							
08/03/93	20								

Biological Summary

Number of taxa: 13
Diversity index: 2.94
RBP score: 20
RBP condition: Moderately impaired



Water Quality Index



Biological Index

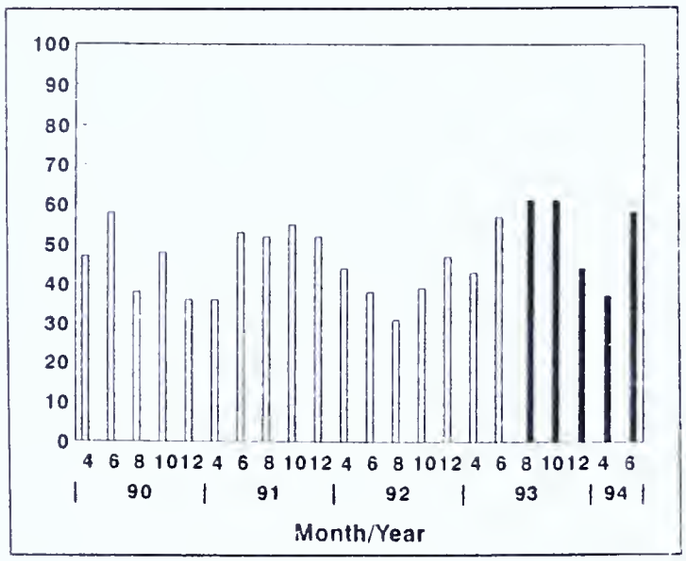
TABLE 32. Water Quality Summary Susquehanna River at Conowingo, Md.

Parameters Exceeding Standards				
Parameter	**Date**	**Value**	**Standard**	**State**
None				

Date	WQI	Parameters Exceeding 90th Percentile							
08/04/93	61	DNO2	TNO2						
10/20/93	61	TSO4							
12/15/93	44	TAl							
04/20/94	37	DMn	TAl						
06/13/94	58	DNH3	TNH3	DMn	TMn				

Biological Summary

Number of taxa: None
Diversity index:
RBP score:
RBP condition:



Water Quality Index

APPENDIX A.

WATER QUALITY DATA FOR INTERSTATE STREAMS CROSSING THE NEW YORK-PENNSYLVANIA AND PENNSYLVANIA-MARYLAND BORDERS

TABLE A1. Water Quality Data for Interstate Streams Crossing the New York-Pennsylvania Border

Station	Date	Time	Discharge	Temper-ature	Specific Conduct-ance	Dissolved Oxygen	Biological Oxygen Demand	pH	Alkalinity	Acidity
			cfs	Celsius	umhos/cm	mg/l	mg/l		mg/l	mg/l
APAL 6.9	07/27/93	10:45	0.6	21.6	135	8.8	2.0	6.76	32	4
BNTY 0.9	07/28/93	12:05	1.2	23.0	302	9.2	0.8	8.60	94	0
CAYT 1.7	07/28/93	10:00	11.9	23.6	741	8.2	1.6	8.30	132	0
CAYT 1.7	09/21/93	10:15	6.6	15.3	1,074	8.7	2.0	7.62	156	8
CAYT 1.7	11/16/93	9:30	78.0	8.6	345	11.5	1.2	7.50	66	2
CAYT 1.7	03/14/94	14:00	133.0	1.1	175	12.6	0.4	7.48		
CAYT 1.7	05/17/94	14:30	141.0	10.2	178	10.6	0.8	7.75	52	4
CHEM 12.0	07/28/93	8:30	328.0	24.8	682	8.9	4.0	8.80	78	0
CHEM 12.0	09/21/93	9:15	205.0	14.5	715	9.0	1.0	8.48	120	0
CHEM 12.0	11/16/93	10:30	1,032.0	8.4	580	10.2	1.2	7.80	84	4
CHEM 12.0	03/14/94	14:45	5,740.0	2.5	234	13.6	0.8	7.58		
CHEM 12.0	05/18/94	9:30	1,910.0	11.7	285	10.2	4.4	8.30	72	0
CHOC 9.1	07/27/93	9:30	0.9	20.5	134	8.2	0.4	6.85	26	6
COWN 2.2	07/27/93	17:30	15.0	23.9	217	8.2	0.8	8.00	52	2
COWN 10.8	09/22/93	9:15	17.0	16.7	236	7.5	0.5	7.00	56	12
COWN 2.2	11/17/93	10:15	116.0	7.8	215	11.2	0.5	7.35	42	4
COWN 2.2	03/15/94	12:30	1,850.0	2.1	168	12.8	1.2	7.26		
COWN 2.2	05/18/94	13:45	107.0	12.1	122	10.0	2.8	7.55	28	4
LSNK 7.6	07/27/93	8:00	1.0	19.3	188	9.2	0.4	7.20	36	4
SEEL 0.3	07/28/93	15:00	4.2	19.3	383	9.4	0.4	7.45	128	2
SNAK 2.3	07/26/93	10:30	1.6	22.0	124	9.6	0.8	8.30	20	0
SOUT 2.8	07/28/93	13:30	0.4	22.1	235	9.7	1.0	7.75	68	2
SUSQ 289.1	07/27/93	13:45	730.0	25.0	406	11.2	1.2	8.41	92	0
SUSQ 289.1	09/21/93	11:45	837.0	15.6	418	9.6	0.5	7.85	100	0
SUSQ 289.1	11/16/93	8:30	7,170.0	7.2	238	11.4	0.8	7.50	52	0
SUSQ 289.1	03/14/94	13:45	14,700.0	1.8	172	14.5	0.8	7.65		
SUSQ 289.1	05/17/94	13:30	6,090.0	11.8	223	10.6	0.8	7.90	68	4

TABLE A1. Water Quality Data for Interstate Streams Crossing the New York-Pennsylvania Border (Continued)

Station	Date	Time	Solids Dissolved	Solids Total	Ammonia Dissolved	Ammonia Total	Nitrite Dissolved	Nitrite Total	Nitrate Dissolved	Nitrate Total
			mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
APAL 6.9	07/27/93	10:45	66	76	0.03	0.05	0.006	0.006	0.21	0.21
BNTY 0.9	07/28/93	12:05	146	146	0.02	0.02	0.008	0.008	0.08	0.14
CAYT 1.7	07/28/93	10:00	410	410	0.05	0.05	0.020	0.020	2.15	2.88
CAYT 1.7	09/21/93	10:15	550	550	0.02	0.04	0.012	0.020	5.06	5.06
CAYT 1.7	11/16/93	9:30	184	184	0.02	0.02	0.014	0.014	0.91	0.93
CAYT 1.7	03/14/94	14:00	132	174	0.02	0.02	0.004	0.006	0.47	0.47
CAYT 1.7	05/17/94	14:30	116	116	0.02	0.02	0.004	0.004	0.29	0.29
CHEM 12.0	07/28/93	8:30	370	390	0.02	0.07	0.008	0.008	0.06	0.06
CHEM 12.0	09/21/93	9:15	384	392	0.02	0.03	0.008	0.012	0.74	0.76
CHEM 12.0	11/16/93	10:30	306	306	0.02	0.02	0.010	0.012	0.74	0.74
CHEM 12.0	03/14/94	14:45	136	170	0.04	0.04	0.006	0.100	0.83	0.85
CHEM 12.0	05/18/94	9:30	190	190	0.03	0.06	0.014	0.014	0.45	0.45
CHOC 9.1	07/27/93	9:30	73	78	0.02	0.02	0.004	0.004	0.17	0.17
COWN 2.2	07/27/93	17:30	132	132	0.02	0.05	0.008	0.008	0.14	0.17
COWN 10.8	09/22/93	9:15		124	0.02	0.04	0.010	0.010	0.14	0.14
COWN 2.2	11/17/93	10:15	104	106	0.08	0.06	0.008	0.008	0.21	0.21
COWN 2.2	03/15/94	12:30	120	132	0.08	0.05	0.008	0.012	1.02	1.02
COWN 2.2	05/18/94	13:45	86	86	0.02	0.06	0.010	0.012	0.45	0.45
LSNK 7.6	07/27/93	8:00	119	122	0.07	0.07	0.004	0.004	0.15	0.17
SEEL 10.3	07/28/93	15:00	200	200	0.02	0.02	0.008	0.008	0.37	0.39
SNAK 2.3	07/26/93	10:30	65	68	0.03	0.04	0.004	0.004	0.13	0.13
SOUT 2.8	07/26/93	13:30	128	128	0.02	0.04	0.006	0.008	0.07	0.10
SUSQ 289.1	07/27/93	13:45	232	240	0.02	0.02	0.004	0.004	0.15	0.15
SUSQ 289.1	09/21/93	11:45	210	210	0.02	0.04	0.010	0.022	0.85	0.86
SUSQ 289.1	11/16/93	8:30	106	124	0.02	0.02	0.010	0.010	0.69	0.69
SUSQ 289.1	03/14/94	13:45	102	134	0.07	0.07	0.010	0.010	0.84	0.84
SUSQ 289.1	05/17/94	13:30	132	132	0.02	0.02	0.018	0.018	0.66	0.66

TABLE A1. Water Quality Data for Interstate Streams Crossing the New York-Pennsylvania Border (Continued)

Station	Date	Time	Kjeldahl Nitrogen, Dissolved	Kjeldahl Nitrogen, Total	Phosphorus Dissolved	Phosphorus, Total	Ortho Phosphorus, Dissolved	Ortho Phosphorus, Total
			mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
APAL 6.9	07/27/93	10:45	0.26	0.46	0.030	0.03	0.002	0.005
BNTY 0.9	07/28/93	12:05	0.20	0.21	0.028	0.04	0.003	0.003
CAYT 1.7	07/28/93	10:00	0.60	0.60	0.428	0.50	0.414	0.489
CAYT 1.7	09/21/93	10:15	0.67	1.18	1.200	1.20	0.990	0.990
CAYT 1.7	11/16/93	9:30	0.33	0.51	0.236	0.30	0.202	0.237
CAYT 1.7	03/14/94	14:00	0.20	0.20	0.018	0.04	0.002	0.004
CAYT 1.7	05/17/94	14:30	0.20	0.20	0.015	0.02	0.002	0.002
CHEM 12.0	07/28/93	8:30	0.58	1.65	0.021	0.10	0.002	0.030
CHEM 12.0	09/21/93	9:15	0.39	0.52	0.078	0.12	0.041	0.078
CHEM 12.0	11/16/93	10:30	0.29	0.43	0.047	0.06	0.013	0.023
CHEM 12.0	03/14/94	14:45	0.20	0.20	0.028	0.07	0.002	0.022
CHEM 12.0	05/18/94	9:30	0.84	1.28	0.029	0.04	0.002	0.014
CHOC 9.1	07/27/93	9:30	0.20	0.29	0.020	0.02	0.002	0.002
COWN 2.2	07/27/93	17:30	0.21	0.38	0.018	0.04	0.002	0.002
COWN 10.8	09/22/93	9:15	0.26	0.34	0.033	0.03	0.010	0.010
COWN 2.2	11/17/93	10:15	0.20	0.25	0.015	0.03	0.002	0.002
COWN 2.2	03/15/94	12:30	0.21	0.22	0.027	0.04	0.002	0.011
COWN 2.2	05/18/94	13:45	0.49	0.50	0.019	0.03	0.002	0.002
LSNK 7.6	07/27/93	8:00	0.26	0.33	0.020	0.02	0.002	0.002
SEEL 10.3	07/28/93	15:00	0.20	0.20	0.018	0.03	0.002	0.002
SNAK 2.3	07/26/93	10:30	0.20	0.20	0.020	0.02	0.002	0.002
SOUT 2.8	07/28/93	13:30	0.33	0.39	0.025	0.05	0.002	0.007
SUSQ 289.1	07/27/93	13:45	0.30	0.57	0.026	0.05	0.002	0.004
SUSQ 289.1	09/21/93	11:45	0.37	0.37	0.078	0.08	0.053	0.053
SUSQ 289.1	11/16/93	8:30	0.28	0.40	0.024	0.05	0.002	0.005
SUSQ 289.1	03/14/94	13:45	0.20	0.25	0.027	0.05	0.002	0.002
SUSQ 289.1	05/17/94	13:30	0.20	0.20	0.019	0.03	0.002	0.006

TABLE A1. Water Quality Data for Interstate Streams Crossing the New York-Pennsylvania Border (Continued)

Station	Date	Time	Organic Carbon, Total	Calcium	Magnesium	Chloride	Sulfate	Turbidity
			mg/l	mg/l	mg/l	mg/l	mg/l	NTU
APAL 6.9	07/27/93	10:45	2.9	10.7	3.28	6	20	9.7
BNTY 0.9	07/28/93	12:05	1.7	29.4	6.04	14	20	1.0
CAYT 1.7	07/28/93	10:00	3.0	44.5	9.04	111	36	1.6
CAYT 1.7	09/21/93	10:15	4.7	52.3	10.20	138	47	2.9
CAYT 1.7	11/16/93	9:30	3.0	27.7	5.72	29	28	7.2
CAYT 1.7	03/14/94	14:00	2.1	16.8	3.87	20	20	33.0
CAYT 1.7	05/17/94	14:30	2.3	19.7	4.20	11	20	2.1
CHEM 12.0	07/28/93	8:30	5.0	30.4	12.00	114	37	17.2
CHEM 12.0	09/21/93	9:15	2.7	49.6	12.30	93	42	7.0
CHEM 12.0	11/16/93	10:30	2.4	42.0	9.73	71	47	5.3
CHEM 12.0	03/14/94	14:45	2.8	30.2	4.51	25	22	18.4
CHEM 12.0	05/18/94	9:30	5.1	30.3	6.72	25	24	4.0
CHOC 9.1	07/27/93	9:30	2.1	9.5	3.07	9	21	5.2
COWN 2.2	07/27/93	17:30	3.4	18.8	3.94	11	24	3.0
COWN 10.8	09/22/93	9:15	3.7	20.0	4.10	13	20	6.4
COWN 2.2	11/17/93	10:15	3.4	23.5	4.82	14	20	4.7
COWN 2.2	03/15/94	12:30	3.4	16.9	3.69	12	20	13.8
COWN 2.2	05/18/94	13:45	4.3	13.8	2.92	7	20	3.0
LSNK 7.6	07/27/93	8:00	3.4	11.4	3.46	14	10	4.9
SEEL 10.3	07/28/93	15:00	1.1	44.3	7.00	13	21	1.0
SNAK 2.3	07/26/93	10:30	1.6	8.2	2.68	10	16	2.9
SOUT 2.8	07/28/93	13:30	4.9	20.9	4.44	13	10	2.6
SUSQ 289.1	07/27/93	13:45	3.4	37.4	7.35	33	41	5.0
SUSQ 289.1	09/21/93	11:45	3.0	36.7	6.48	34	21	4.8
SUSQ 289.1	11/16/93	8:30	3.1	26.1	4.14	14	31	8.7
SUSQ 289.1	03/14/94	13:45	2.4	17.0	2.85	17	20	18.8
SUSQ 289.1	05/17/94	13:30	2.3	26.8	4.21	15	22	2.5

TABLE A1. Water Quality Data for Interstate Streams Crossing the New York-Pennsylvania Border (Continued)

Station	Date	Time	Iron, Dissolved	Iron, Total	Manganese, Dissolved	Manganese, Total	Aluminum, Dissolved	Aluminum, Total
			µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
APAL 6.9	07/27/93	10:45	302	744	148	213	239	379
BNTY 0.9	07/28/93	12:05	10	10	10	10	223	232
CAYT 1.7	07/28/93	10:00	10	28	10	13	230	289
CAYT 1.7	09/21/93	10:15	17	652	6	10	299	318
CAYT 1.7	11/16/93	9:30	30	348	10	10	341	434
CAYT 1.7	03/14/94	14:00	54	1,430	18	51	302	1,680
CAYT 1.7	05/17/94	14:30	44	140	10	10	135	135
CHEM 12.0	07/28/93	8:30	10	217	10	202	241	436
CHEM 12.0	09/21/93	9:15	18	132	4	53	303	337
CHEM 12.0	11/16/93	10:30	80	127	10	17	367	367
CHEM 12.0	03/14/94	14:45	70	602	67	91	348	858
CHEM 12.0	05/18/94	9:30	25	149	12	31	135	135
CHOC 9.1	07/27/93	9:30	544	1,030	53	79	232	313
COWN 2.2	07/27/93	17:30	10	20	39	96	224	246
COWN 10.8	09/22/93	9:15	18	94	102	171	5	304
COWN 2.2	11/17/93	10:15	15	130	187	198	326	331
COWN 2.2	03/15/94	12:30	62	419	75	90	1,320	1,940
COWN 2.2	05/18/94	13:45	22	117	20	32	135	135
LSNK 7.6	07/27/93	8:00	195	489	55	74	177	278
SEEL 10.3	07/28/93	15:00	10	10	10	10	186	194
SNAK 2.3	07/26/93	10:30	21	54	11	16	211	226
SOUT 2.8	07/28/93	13:30	10	136	50	63	204	248
SUSQ 289.1	07/27/93	13:45	28	244	11	55	232	397
SUSQ 289.1	09/21/93	11:45	10	71	3	26	353	353
SUSQ 289.1	11/16/93	8:30	78	298	10	10	426	467
SUSQ 289.1	03/14/94	13:45	34	722	17	39	336	898
SUSQ 289.1	05/17/94	13:30	24	197	10	17	135	135

TABLE A1. Water Quality Data for Interstate Streams Crossing the New York-Pennsylvania Border (Continued)

Station	Date	Time	Discharge	Temper-ature	Specific Conduct-ance	Dissolved Oxygen	Biological Oxygen Demand	pH	Alkalinity	Acidity
			cfs	Celsius	umhos/cm	mg/l	mg/l		mg/l	mg/l
SUSQ 340.0	07/26/93	12:05	341.0	23.8	267	9.1	0.4	8.70	72	0
SUSQ 340.0	09/20/93	10:45	388.0	15.7	252	10.2	0.5	8.40	70	0
SUSQ 340.0	11/15/93	10:50	2,680.0	9.4	194	11.6	0.8	7.85	48	4
SUSQ 340.0	03/14/94	10:45	17,680.0	1.4	139	13.4	0.8	6.61		
SUSQ 340.0	05/17/94	10:30	2,700.0	11.9	169	9.8	1.6	7.90	56	6
SUSQ 365.0	07/26/93	13:40	123.0	22.7	282	9.8	0.8	8.41	80	0
SUSQ 365.0	09/20/93	11:20	270.0	15.2	290	10.6	0.5	7.50	80	8
SUSQ 365.0	11/15/93	16:15	1,050.0	9.0	220	12.4	0.8	8.05	56	4
SUSQ 365.0	03/14/94	11:30		0.9	139	13.3	0.8	7.38		
SUSQ 365.0	05/17/94	12:00	3,260.0	11.3	179	10.4	1.5	7.80	52	4
TIOG 10.8	07/27/93	15:30	60.7	24.3	280	9.8	0.8	7.80	36	2
TIOG 10.8	09/21/93	13:45	10.0	14.8	332	9.0	0.5	6.96	30	4
TIOG 10.8	11/17/93	8:30	428.0	6.0	264	11.9	0.8	7.20	24	8
TIOG 10.8	03/15/94	10:30	3,080.0	1.9	168	13.5	2.0	7.31		
TIOG 10.8	05/18/94	12:00	372.0	11.2	158	10.6	1.6	7.55	28	0
TRUP 4.5	07/29/93	10:30	0.9	23.2	367	8.8	0.4	8.40	102	0
TRUP 4.5	09/22/93	11:15	5.6	13.3	403	9.7	0.5	8.20	102	1
TRUP 4.5	11/17/93	11:30	21.0	5.8	260	13.4	0.5	7.85	56	0
TRUP 4.5	03/15/94	9:00	9.8	1.1	175	13.4	1.2	7.63		
TRUP 4.5	05/18/94	15:00	14.4	9.6	178	10.6	1.2	8.70	62	0
WAPP 2.6	07/27/93	12:05	1.7	23.9	178	9.4	0.4	7.09	38	6

TABLE A1. Water Quality Data for Interstate Streams Crossing the New York-Pennsylvania Border (Continued)

Station	Date	Time	Solids, Dissolved	Solids, Total	Ammonia, Dissolved	Ammonia, Total	Nitrite, Dissolved	Nitrite, Total	Nitrate, Dissolved	Nitrate, Total
			mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
SUSQ 340.0	07/26/93	12:05	138	138	0.02	0.03	0.004	0.004	0.06	0.06
SUSQ 340.0	09/20/93	10:45	146	146	0.02	0.03	0.010	0.010	0.21	0.21
SUSQ 340.0	11/15/93	10:50	114	118	0.02	0.02	0.004	0.004	0.48	0.48
SUSQ 340.0	03/14/94	10:45	98	124	0.02	0.02	0.010	0.010	0.80	0.80
SUSQ 340.0	05/17/94	10:30	102	106	0.02	0.03	0.014	0.012	0.44	0.44
SUSQ 365.0	07/26/93	13:40	133	140	0.02	0.02	0.004	0.004	0.30	0.30
SUSQ 365.0	09/20/93	11:20		164	0.02	0.03	0.008	0.010	0.47	0.47
SUSQ 365.0	11/15/93	16:15	116	126	0.02	0.02	0.004	0.004	0.57	0.59
SUSQ 365.0	03/14/94	11:30	108	136	0.03	0.03	0.008	0.008	0.80	0.83
SUSQ 365.0	05/17/94	12:00	104	104	0.02	0.02	0.006	0.008	0.56	0.56
TIOG 10.8	07/27/93	15:30	180	182	0.02	0.07	0.010	0.010	0.54	0.56
TIOG 10.8	09/21/93	13:45	214	214	0.02	0.02	0.006	0.008	0.39	0.39
TIOG 10.8	11/17/93	8:30	144	148	0.06	0.07	0.004	0.004	0.37	0.37
TIOG 10.8	03/15/94	10:30	126	142	0.07	0.07	0.006	0.104	0.91	0.94
TIOG 10.8	05/18/94	12:00	106	114	0.02	0.03	0.008	0.010	0.41	0.43
TRUP 4.5	07/29/93	10:30	188	190	0.02	0.02	0.006	0.006	0.08	0.08
TRUP 4.5	09/22/93	11:15		232	0.02	0.02	0.004	0.004	0.04	0.04
TRUP 4.5	11/17/93	11:30	110	128	0.02	0.02	0.004	0.004	0.37	0.37
TRUP 4.5	03/15/94	9:00	128	166	0.04	0.05	0.006	0.014	0.87	0.87
TRUP 4.5	05/18/94	15:00	96	96	0.02	0.02	0.004	0.004	0.07	0.07
WAPP 2.6	07/27/93	12:05	91	96	0.02	0.02	0.004	0.004	0.77	0.77

TABLE A1. Water Quality Data for Interstate Streams Crossing the New York-Pennsylvania Border (Continued)

Station	Date	Time	Kjeldahl Nitrogen, Dissolved	Kjeldahl Nitrogen, Total	Phosphorus, Dissolved	Phosphorus, Total	Ortho Phosphorus, Dissolved	Ortho Phosphorus, Total
			mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
SUSQ 340.0	07/26/93	12:05	0.25	0.30	0.020	0.02	0.002	0.004
SUSQ 340.0	09/20/93	10:45	0.29	0.33	0.027	0.04	0.002	0.002
SUSQ 340.0	11/15/93	10:50	0.27	0.27	0.040	0.04	0.002	0.002
SUSQ 340.0	03/14/94	10:45	0.20	0.20	0.021	0.04	0.002	0.009
SUSQ 340.0	05/17/94	10:30	0.20	0.20	0.016	0.03	0.002	0.002
SUSQ 365.0	07/26/93	13:40	0.20	0.29	0.020	0.02	0.002	0.006
SUSQ 365.0	09/20/93	11:20	0.28	0.31	0.060	0.06	0.044	0.044
SUSQ 365.0	11/15/93	16:15	0.24	0.35	0.020	0.03	0.002	0.002
SUSQ 365.0	03/14/94	11:30	0.20	0.20	0.015	0.05	0.002	0.009
SUSQ 365.0	05/17/94	12:00	0.20	0.20	0.016	0.03	0.002	0.002
TIOG 10.8	07/27/93	15:30	0.20	0.34	0.020	0.05	0.003	0.004
TIOG 10.8	09/21/93	13:45	0.20	0.20	0.020	0.02	0.002	0.002
TIOG 10.8	11/17/93	8:30	0.20	0.20	0.018	0.03	0.002	0.002
TIOG 10.8	03/15/94	10:30	0.34	0.40	0.027	0.04	0.002	0.008
TIOG 10.8	05/18/94	12:00	0.20	0.20	0.015	0.03	0.002	0.002
TRUP 4.5	07/29/93	10:30	0.20	0.20	0.016	0.03	0.002	0.002
TRUP 4.5	09/22/93	11:15	0.20	0.20	0.020	0.02	0.015	0.015
TRUP 4.5	11/17/93	11:30	0.20	0.20	0.018	0.02	0.002	0.002
TRUP 4.5	03/15/94	9:00	0.20	0.20	0.028	0.05	0.002	0.009
TRUP 4.5	05/18/94	15:00	0.20	0.20	0.015	0.02	0.002	0.002
WAPP 2.6	07/27/93	12:05	0.26	0.28	0.020	0.02	0.002	0.002

TABLE A1. Water Quality Data for Interstate Streams Crossing the New York-Pennsylvania Border (Continued)

Station	Date	Time	Organic Carbon, Total	Calcium	Magnesium	Chloride	Sulfate	Turbidity
			mg/l	mg/l	mg/l	mg/l	mg/l	NTU
SUSQ 340.0	07/26/93	12:05	2.6	28.7	3.94	14	19	2.5
SUSQ 340.0	09/20/93	10:45	2.5	75.0	27.80	4	12	3.7
SUSQ 340.0	11/15/93	10:50	2.9	21.3	3.01	9	28	5.6
SUSQ 340.0	03/14/94	10:45	2.4	16.3	2.39	12	20	16.5
SUSQ 340.0	05/17/94	10:30	2.6	22.5	2.72	9	59	4.3
SUSQ 365.0	07/26/93	13:40	2.6	31.5	4.13	14	21	2.0
SUSQ 365.0	09/20/93	11:20	2.4	32.6	4.07	15	20	4.7
SUSQ 365.0	11/15/93	16:15	2.8	26.8	3.24	10	24	4.3
SUSQ 365.0	03/14/94	11:30	2.4	16.4	2.11	10	20	19.0
SUSQ 365.0	05/17/94	12:00	2.2	24.2	2.72	8	27	3.4
TIOG 10.8	07/27/93	15:30	2.6	25.8	7.11	11	60	2.1
TIOG 10.8	09/21/93	13:45	2.0	26.8	8.35	10	80	5.2
TIOG 10.8	11/17/93	8:30	2.0	23.0	7.32	11	60	2.7
TIOG 10.8	03/15/94	10:30	3.7	16.4	3.73	12	24	14.7
TIOG 10.8	05/18/94	12:00	2.5	16.2	4.34	7	27	8.0
TRUP 4.5	07/29/93	10:30	2.5	35.5	7.19	20	25	3.1
TRUP 4.5	09/22/93	11:15	2.3	34.3	8.12	25	28	1.8
TRUP 4.5	11/17/93	11:30	3.1	26.0	6.34	14	30	13.3
TRUP 4.5	03/15/94	9:00	3.3	16.3	4.07	16	20	43.0
TRUP 4.5	05/18/94	15:00	2.9	21.3	4.55	6	20	2.3
WAPP 2.6	07/27/93	12:05	2.0	13.5	4.26	9	25	2.0

TABLE A1. Water Quality Data for Interstate Streams Crossing the New York-Pennsylvania Border (Continued)

Station	Date	Time	Iron, Dissolved	Iron, Total	Manganese, Dissolved	Manganese, Total	Aluminum, Dissolved	Aluminum, Total
			µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
SUSQ 340.0	07/26/93	12:05	29	59	10	31	258	269
SUSQ 340.0	09/20/93	10:45	18	107	7	29	297	394
SUSQ 340.0	11/15/93	10:50	77	298	40	99	426	564
SUSQ 340.0	03/14/94	10:45	109	650	22	43	481	954
SUSQ 340.0	05/17/94	10:30	16	197	16	29	135	135
SUSQ 365.0	07/26/93	13:40	30	91	10	24	237	264
SUSQ 365.0	09/20/93	11:20	10	90	5	22	285	288
SUSQ 365.0	11/15/93	16:15	82	314	10	10	387	497
SUSQ 365.0	03/14/94	11:30	61	659	18	41	343	891
SUSQ 365.0	05/17/94	12:00	60	215	14	20	135	135
TIOG 10.8	07/27/93	15:30	10	100	21	96	172	372
TIOG 10.8	09/21/93	13:45	10	10	132	140	285	362
TIOG 10.8	11/17/93	8:30	10	130	801	913	357	357
TIOG 10.8	03/15/94	10:30	75	528	184	227	388	856
TIOG 10.8	05/18/94	12:00	18	226	340	423	135	135
TRUP 4.5	07/29/93	10:30	10	42	10	10	227	254
TRUP 4.5	09/22/93	11:15	20	77	5	5	250	299
TRUP 4.5	11/17/93	11:30	15	364	10	10	386	618
TRUP 4.5	03/15/94	9:00	83	1,380	14	28	394	1,710
TRUP 4.5	05/18/94	15:00	10	114	10	10	135	135
WAPP 2.6	07/27/93	12:05	61	141	22	25	190	236

TABLE A2. Water Quality Data for Interstate Streams Crossing the Pennsylvania-Maryland Border

Station	Date	Time	Discharge cfs	Temper-ature Celsius	Specific Conduct-ance umhos/cm	Dissolved Oxygen mg/l	Biological Oxygen Demand mg/l	pH	Alkalinity mg/l	Acidity mg/l
BBDC 4.1	08/03/93	13:30	1.3	17.9	135	8.9	0.8	7.05	14	4
CNWG 4.4	08/05/93	12:10	13.1	22.2	242	8.1	1.6	7.40	30	4
CNWG 4.4	10/20/93	12:30	19.5	13.6	253	10.2	0.8	7.10	28	6
CNWG 4.4	12/15/93	11:35	37.0	5.8	250	12.7	0.4	6.80	20	1
CNWG 4.4	04/20/94	12:35	23.1	14.5	204	12.2	0.4	8.35	32	0
CNWG 4.4	06/14/94	11:40	24.6	22.7	214	7.6	3.2	7.40	32	4
DEER 44.2	08/03/93	10:30	7.2	20.6	203	8.2	0.8	7.40	36	4
DEER 44.2	10/19/93	9:45	6.4	12.3	208	9.1	0.4	7.29	36	4
DEER 44.2	12/14/93	9:15	19.9	4.7	194	10.9	1.2	7.20	22	2
DEER 44.2	04/19/94	9:30	9.2	11.7	165	13.1	0.4	7.35	26	4
DEER 44.2	06/13/94	9:30	12.2	18.2	187	8.8	0.8	7.55	36	4
EBAU 1.5	08/03/93	11:15	4.0	19.3	230	8.6	0.8	7.35	28	4
EBAU 1.5	10/19/93	10:30	4.3	11.6	645	9.2	0.4	7.15	30	4
EBAU 1.5	12/14/93	10:15	10.6	5.2	347	7.2	0.8	7.40	18	2
EBAU 1.5	04/19/94	10:45	4.3	11.0	253	12.5	0.8	7.15	22	6
EBAU 1.5	06/13/94	10:30	6.4	17.1	393	9.2	2.0	7.00	28	4
FBDC 4.1	08/03/93	14:45	1.2	22.3	139	9.2	0.4	7.05	20	4
LNGA 2.5	08/02/93	11:30	0.7	21.9	202	8.8	0.8	8.32	28	0
OCTO 6.6	08/04/93	14:45	48.3	25.8	258	8.0	0.5	8.10	42	2
OCTO 6.6	10/20/93	11:45	59.6	14.0	257	9.7	1.0	7.40	40	4
OCTO 6.6	12/15/93	11:00	223.0	6.0	190	11.9	2.0	7.25	28	2
OCTO 6.6	04/20/94	11:30		14.3	203	11.2	1.5	7.10	32	4
OCTO 6.6	06/14/94	10:30	58.1	23.7	222	7.8	0.8	7.70	38	4
SBCC 20.4	08/02/93	14:00	0.5	19.6	131	8.5	0.8	7.81	38	4
SCTT 3.0	08/04/93	11:35	0.2	18.6	430	7.3	0.8	7.48	128	8
SCTT 3.0	10/19/93	12:30	0.5	12.1	424	8.9	0.8	7.50	88	6
SCTT 3.0	12/14/93	11:30	0.9	6.7	289	10.2	0.4	7.30	34	4
SCTT 3.0	04/19/94	12:05	2.3	12.8	213	10.2	1.2	7.00	28	10
SCTT 3.0	06/13/94	11:40	0.4	17.7	287	8.5	2.0	6.51	40	20

TABLE A2. Water Quality Data for Interstate Streams Crossing the Pennsylvania-Maryland Border (Continued)

Station	Date	Time	Solids, Dissolved	Solids, Total	Ammonia, Dissolved	Ammonia, Total	Nitrite, Dissolved	Nitrite, Total	Nitrate, Dissolved	Nitrate, Total
			mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
BBDC 4.1	08/03/93	13:30	88	88	0.02	0.02	0.006	0.008	5.07	5.31
CNWG 4.4	08/05/93	12:10	181	192	0.03	0.03	0.028	0.030	7.71	7.71
CNWG 4.4	10/20/93	12:30	142	156	0.02	0.02	0.014	0.014	16.70	16.90
CNWG 4.4	12/15/93	11:35	162	162	0.03	0.04	0.014	0.018	4.73	4.73
CNWG 4.4	04/20/94	12:35	144	152	0.02	0.02	0.040	0.040	7.46	7.46
CNWG 4.4	06/14/94	11:40	132	172	0.06	0.16	0.136	0.146	6.15	6.38
DEER 44.2	08/03/93	10:30	138	144	0.02	0.02	0.010	0.010	4.10	4.10
DEER 44.2	10/19/93	9:45	130	138	0.02	0.02	0.008	0.008	5.01	5.01
DEER 44.2	12/14/93	9:15	102	116	0.02	0.03	0.010	0.010	5.32	5.80
DEER 44.2	04/19/94	9:30	106	112	0.02	0.02	0.008	0.008	4.83	4.83
DEER 44.2	06/13/94	9:30	104	114	0.02	0.06	0.026	0.028	4.06	4.06
EBAU 1.5	08/03/93	11:15	114	124	0.03	0.03	0.014	0.014	5.31	5.31
EBAU 1.5	10/19/93	10:30	384	404	0.07	0.08	0.050	0.050	6.29	6.29
EBAU 1.5	12/14/93	10:15	192	192	0.09	0.09	0.040	0.042	5.32	6.16
EBAU 1.5	04/19/94	10:45	148	158	0.20	0.20	0.040	0.044	5.28	5.28
EBAU 1.5	06/13/94	10:30	272	282	0.07	0.07	0.090	0.104	5.06	5.18
FBDC 4.1	08/03/93	14:45	79	82	0.02	0.03	0.006	0.008	3.62	3.62
LNGA 2.5	08/02/93	11:30	127	148	0.02	0.05	0.012	0.014	6.76	6.76
OCTO 6.6	08/04/93	14:45	162	176	0.02	0.02	0.022	0.022	5.06	5.06
OCTO 6.6	10/20/93	11:45	113	140	0.02	0.02	0.012	0.014	6.33	6.46
OCTO 6.6	12/15/93	11:00	150	154	0.20	0.23	0.030	0.044	3.65	3.66
OCTO 6.6	04/20/94	11:30	136	140	0.03	0.03	0.052	0.054	6.24	6.24
OCTO 6.6	06/14/94	10:30	130	140	0.02	0.07	0.048	0.050	5.27	5.52
SBCC 20.4	08/02/93	14:00	69	102	0.02	0.03	0.004	0.006	1.47	1.51
SCTT 3.0	08/04/93	11:35	268	278	0.07	0.08	0.018	0.020	0.64	0.66
SCTT 3.0	10/19/93	12:30	252	256	0.10	0.10	0.036	0.040	1.44	1.50
SCTT 3.0	12/14/93	11:30	138	140	0.12	0.12	0.020	0.020	3.15	3.32
SCTT 3.0	04/19/94	12:05	118	126	0.04	0.04	0.016	0.018	1.98	1.98
SCTT 3.0	06/13/94	11:40	173	176	0.16	0.17	0.114	0.124	2.93	3.05

TABLE A2. Water Quality Data for Interstate Streams Crossing the Pennsylvania-Maryland Border (Continued)

Station	Date	Time	Kjeldahl Nitrogen, Dissolved	Kjeldahl Nitrogen, Total	Phosphorus, Dissolved	Phosphorus, Total	Ortho Phosphorus, Dissolved	Ortho Phosphorus, Total
			mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
BBDC 4.1	08/03/93	13:30	0.20	0.21	0.019	0.04	0.010	0.010
CNWG 4.4	08/05/93	12:10	0.21	0.41	0.049	0.08	0.010	0.030
CNWG 4.4	10/20/93	12:30	0.36	0.41	0.050	0.06	0.014	0.014
CNWG 4.4	12/15/93	11:35	0.29	0.40	0.045	0.09	0.018	0.018
CNWG 4.4	04/20/94	12:35	0.23	0.24	0.037	0.06	0.011	0.020
CNWG 4.4	06/14/94	11:40	0.48	1.28	0.070	0.16	0.036	0.067
DEER 44.2	08/03/93	10:30	0.30	0.30	0.037	0.05	0.013	0.013
DEER 44.2	10/19/93	9:45	0.29	0.30	0.025	0.02	0.002	0.002
DEER 44.2	12/14/93	9:15	0.20	0.29	0.045	0.13	0.014	0.070
DEER 44.2	04/19/94	9:30	0.20	0.20	0.016	0.02	0.002	0.002
DEER 44.2	06/13/94	9:30	0.20	0.50	0.030	0.05	0.004	0.004
EBAU 1.5	08/03/93	11:15	0.29	0.35	0.066	0.09	0.037	0.038
EBAU 1.5	10/19/93	10:30	0.63	0.73	0.046	0.05	0.013	0.013
EBAU 1.5	12/14/93	10:15	0.23	0.31	0.057	0.06	0.023	0.023
EBAU 1.5	04/19/94	10:45	0.25	0.25	0.017	0.03	0.002	0.002
EBAU 1.5	06/13/94	10:30	0.55	0.58	0.025	0.06	0.002	0.007
FBDC 4.1	08/03/93	14:45	0.20	0.21	0.017	0.03	0.010	0.010
LNGA 2.5	08/02/93	11:30	0.42	0.51	0.026	0.04	0.015	0.010
OCTO 6.6	08/04/93	14:45	0.29	0.37	0.041	0.06	0.028	0.000
OCTO 6.6	10/20/93	11:45	0.48	0.70	0.097	0.11		
OCTO 6.6	12/15/93	11:00	0.84	0.84	0.269	0.37	0.156	0.251
OCTO 6.6	04/20/94	11:30	0.41	0.59	0.059	0.10	0.006	0.032
OCTO 6.6	06/14/94	10:30	0.40	0.40	0.038	0.05	0.004	0.023
SBCC 20.4	08/02/93	14:00	0.20	0.20	0.020	0.02	0.011	0.010
SCTT 3.0	08/04/93	11:35	0.34	0.34	0.064	0.09	0.053	0.055
SCTT 3.0	10/19/93	12:30	0.32	0.48	0.080	0.08	0.049	0.049
SCTT 3.0	12/14/93	11:30	0.20	0.20	0.050	0.05	0.014	0.014
SCTT 3.0	04/19/94	12:05	0.27	0.27	0.043	0.06	0.023	0.024
SCTT 3.0	06/13/94	11:40	0.35	0.49	0.082	0.12	0.051	0.051

TABLE A2. Water Quality Data for Interstate Streams Crossing the Pennsylvania-Maryland Border (Continued)

Station	Date	Time	Organic Carbon, Total	Calcium	Magnesium	Chloride	Sulfate	Turbidity
			mg/l	mg/l	mg/l	mg/l	mg/l	NTU
BBDC 4.1	08/03/93	13:30	1.4	7.4	4.74	9	17	4.4
CNWG 4.4	08/05/93	12:10	2.6	15.6	9.18	17	13	9.0
CNWG 4.4	10/20/93	12:30	2.2	15.5	8.57	16	20	5.8
CNWG 4.4	12/15/93	11:35	1.5	15.8	9.17	16	21	5.5
CNWG 4.4	04/20/94	12:35	2.0	15.4	8.79	13	20	6.8
CNWG 4.4	06/14/94	11:40	3.8	17.4	8.51	16	20	40.0
DEER 44.2	08/03/93	10:30	3.5	14.8	5.79	16	10	7.8
DEER 44.2	10/19/93	9:45	1.9	15.5	6.43	17	26	3.9
DEER 44.2	12/14/93	9:15	1.3	13.6	5.48	16	20	6.0
DEER 44.2	04/19/94	9:30	1.2	13.2	5.05	14	26	4.2
DEER 44.2	06/13/94	9:30	2.9	18.4	5.50	18	20	11.4
EBAU 1.5	08/03/93	11:15	2.1	13.7	5.30	21	22	12.9
EBAU 1.5	10/19/93	10:30	1.7	38.5	5.66	115	20	7.4
EBAU 1.5	12/14/93	10:15	1.1	21.4	5.31	54	20	4.7
EBAU 1.5	04/19/94	10:45	1.3	17.7	5.23	37	20	5.7
EBAU 1.5	06/13/94	10:30	2.1	30.8	5.04	82	20	6.3
FBDC 4.1	08/03/93	14:45	1.8	7.8	4.27	12	13	3.6
LNGA 2.5	08/02/93	11:30	1.5	80.5	23.30	14	10	8.8
OCTO 6.6	08/04/93	14:45	2.9	17.7	9.22	15	16	6.5
OCTO 6.6	10/20/93	11:45	4.8	16.0	9.12	10		
OCTO 6.6	12/15/93	11:00	4.8	12.1	6.09	10	20	62.0
OCTO 6.6	04/20/94	11:30	3.6	18.2	8.35	11	20	7.4
OCTO 6.6	06/14/94	10:30	2.2	20.4	9.22	14	20	3.0
SBCC 20.4	08/02/93	14:00	1.7	23.7	6.37	6	10	4.7
SCTT 3.0	08/04/93	11:35	2.6	21.3	27.70	21	24	2.2
SCTT 3.0	10/19/93	12:30	2.5	24.3	19.10	35	32	2.1
SCTT 3.0	12/14/93	11:30	1.6	16.5	9.49	32	20	1.7
SCTT 3.0	04/19/94	12:05	2.3	12.6	7.34	28	20	4.8
SCTT 3.0	06/13/94	11:40	3.0	20.7	9.65	34	20	4.6

TABLE A2. Water Quality Data for Interstate Streams Crossing the Pennsylvania-Maryland Border (Continued)

Station	Date	Time	Iron, Dissolved	Iron, Total	Manganese, Dissolved	Manganese, Total	Aluminum, Dissolved	Aluminum, Total
			µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
BBDC 4.1	08/03/93	13:30	23	157	11	20	178	278
CNWG 4.4	08/05/93	12:10	32	465	27	51	135	326
CNWG 4.4	10/20/93	12:30	101	246	32	32	359	413
CNWG 4.4	12/15/93	11:35	78	245	28	31	373	407
CNWG 4.4	04/20/94	12:35	30	265	58	59	135	191
CNWG 4.4	06/14/94	11:40	71	1,240	46	90	135	996
DEER 44.2	08/03/93	10:30	35	293	17	27	246	340
DEER 44.2	10/19/93	9:45	84	176	25	31	389	396
DEER 44.2	12/14/93	9:15	67	382	22	27	400	504
DEER 44.2	04/19/94	9:30	65	115	25	29	135	135
DEER 44.2	06/13/94	9:30	36	459	29	29	135	341
EBAU 1.5	08/03/93	11:15	65	383	49	60	251	341
EBAU 1.5	10/19/93	10:30	108	254	62	72	366	395
EBAU 1.5	12/14/93	10:15	55	224	31	46	243	402
EBAU 1.5	04/19/94	10:45	27	221	30	39	135	135
EBAU 1.5	06/13/94	10:30	149	515	82	91	135	302
FBDC 4.1	08/03/93	14:45	53	176	14	19	248	262
LNGA 2.5	08/02/93	11:30	38	736	300	747	255	636
OCTO 6.6	08/04/93	14:45	10	184	6	25	198	246
OCTO 6.6	10/20/93	11:45	47	226	10	16	303	406
OCTO 6.6	12/15/93	11:00	212	2,170	19	51	425	1,990
OCTO 6.6	04/20/94	11:30	97	4,170	149	40	137	137
OCTO 6.6	06/14/94	10:30	15	94	11	22	44	85
SBCC 20.4	08/02/93	14:00	37	659	78	153	246	606
SCTT 3.0	08/04/93	11:35	62	194	45	55	249	249
SCTT 3.0	10/19/93	12:30	47	160	30	34	359	420
SCTT 3.0	12/14/93	11:30	129	129	45	48	365	365
SCTT 3.0	04/19/94	12:05	45	249	34	45	135	135
SCTT 3.0	06/13/94	11:40	88	344	37	37	135	135

TABLE A2. Water Quality Data for Interstate Streams Crossing the Pennsylvania-Maryland Border (Continued)

Station	Date	Time	Discharge	Temper-ature	Specific Conduct-ance	Dissolved Oxygen	Biological Oxygen Demand	pH	Alkalinity	Acidity
			cfs	Celsius	umhos/cm	mg/l	mg/l		mg/l	mg/l
SUSQ 10.0	08/04/93	13:10	6,250.0	29.7	420	6.3	2.0	7.41	72	6
SUSQ 10.0	10/20/93	10:30	31,900.0	16.3	407	7.8	1.6	7.60	56	4
SUSQ 10.0	12/15/93	10:15	72,500.0	4.4	202	10.6	0.8	7.30	32	4
SUSQ 10.0	04/20/94	10:30	146,000.0	12.8	155	10.6	0.4	7.21	28	6
SUSQ 10.0	06/13/94	13:00	42,900.0	25.2	307	6.2	1.2	7.60	60	2
SUSQ 44.5	08/05/93	15:05	6,170.0	27.2	487	8.7	2.5	8.25	62	1
SUSQ 44.5	10/21/93	12:00	7,770.0	16.4	408	9.7	1.5	7.90	58	2
SUSQ 44.5	12/16/93	10:30	56,600.0	5.2	213	12.2	2.5	7.70	32	2
SUSQ 44.5	04/21/94	11:15	105,000.0	12.2	200	10.6	1.0	7.40	40	4
SUSQ 44.5	06/15/94	9:30	28,300.0	27.3	316	9.0	3.5	8.05	44	2

TABLE A2. Water Quality Data for Interstate Streams Crossing the Pennsylvania-Maryland Border (Continued)

Station	Date	Time	Solids, Dissolved	Solids, Total	Ammonia, Dissolved	Ammonia, Total	Nitrite, Dissolved	Nitrite, Total	Nitrate, Dissolved	Nitrate, Total
			mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
SUSQ 10.0	08/04/93	13:10	231	258	0.05	0.07	0.084	0.088	1.00	1.01
SUSQ 10.0	10/20/93	10:30	264	282	0.07	0.10	0.018	0.020	1.17	1.17
SUSQ 10.0	12/15/93	10:15	122	124	0.04	0.04	0.010	0.012	1.53	1.53
SUSQ 10.0	04/20/94	10:30	62	82	0.04	0.04	0.008	0.010		1.08
SUSQ 10.0	06/13/94	13:00	172	180	0.20	0.23	0.028	0.030	0.90	0.92
SUSQ 44.5	08/05/93	15:05	235	320	0.02	0.02	0.010	0.012	0.74	0.74
SUSQ 44.5	10/21/93	12:00	3,072	3,076	0.03	0.05	0.014	0.014	1.13	1.13
SUSQ 44.5	12/16/93	10:30	96	326	0.05	0.05	0.008	0.012	1.29	1.42
SUSQ 44.5	04/21/94	11:15	146	186	0.05	0.05	0.012	0.012	1.42	1.42
SUSQ 44.5	06/15/94	9:30	206	250	0.02	0.02	0.014	0.020	0.60	0.60

TABLE A2. Water Quality Data for Interstate Streams Crossing the Pennsylvania-Maryland Border (Continued)

Station	Date	Time	Kjeldahl Nitrogen, Dissolved	Kjeldahl Nitrogen, Total	Phosphorus, Dissolved	Phosphorus, Total	Ortho Phosphorus, Dissolved	Ortho Phosphorus, Total
			mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
SUSQ 10.0	08/04/93	13:10	0.42	0.50	0.020	0.04	0.011	0.011
SUSQ 10.0	10/20/93	10:30	0.41	0.69	0.020	0.05	0.002	0.003
SUSQ 10.0	12/15/93	10:15	0.31	0.33	0.029	0.05	0.002	0.003
SUSQ 10.0	04/20/94	10:30	0.24	0.24	0.036	0.06	0.003	0.003
SUSQ 10.0	06/13/94	13:00	0.34	0.55	0.026	0.05	0.002	0.007
SUSQ 44.5	08/05/93	15:05	0.32	0.58	0.027	0.05	0.002	0.002
SUSQ 44.5	10/21/93	12:00	0.25	0.36	0.016	0.03		0.002
SUSQ 44.5	12/16/93	10:30	0.29	0.33	0.027	0.05	0.002	0.003
SUSQ 44.5	04/21/94	11:15	0.32	0.32	0.028	0.07	0.002	0.002
SUSQ 44.5	06/15/94	9:30	0.20	0.65	0.019	0.08	0.002	0.002

TABLE A2. Water Quality Data for Interstate Streams Crossing the Pennsylvania-Maryland Border (Continued)

Station	Date	Time	Organic Carbon, Total	Calcium	Magnesium	Chloride	Sulfate	Turbidity
			mg/l	mg/l	mg/l	mg/l	mg/l	NTU
SUSQ 10.0	08/04/93	13:10	2.9	35.6	12.80	21	52	4.6
SUSQ 10.0	10/20/93	10:30	2.7	32.6	10.80	22	66	11.2
SUSQ 10.0	12/15/93	10:15	2.7	17.7	4.89	9	24	16.1
SUSQ 10.0	04/20/94	10:30	2.6	15.0	4.14	7	20	22.0
SUSQ 10.0	06/13/94	13:00	2.5	33.3	8.84	18	63	8.6
SUSQ 44.5	08/05/93	15:05	3.6	39.3	14.80	28	83	7.9
SUSQ 44.5	10/21/93	12:00	2.6	35.9	10.80	24	71	3.6
SUSQ 44.5	12/16/93	10:30	2.3	18.7	5.39	9	45	10.9
SUSQ 44.5	04/21/94	11:15	2.5	21.4	5.68	10	28	30.0
SUSQ 44.5	06/15/94	9:30	3.3	33.7	10.40	16	71	24.0

TABLE A2. Water Quality Data for Interstate Streams Crossing the Pennsylvania-Maryland Border (Continued)

Station	Date	Time	Iron, Dissolved	Iron, Total	Manganese, Dissolved	Manganese, Total	Aluminum, Dissolved	Aluminum, Total
			µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
SUSQ 10.0	08/04/93	13:10	10	111	32	96	283	383
SUSQ 10.0	10/20/93	10:30	10	245	31	130	284	442
SUSQ 10.0	12/15/93	10:15	101	478	82	112	291	778
SUSQ 10.0	04/20/94	10:30	127	770	131	153	171	675
SUSQ 10.0	06/13/94	13:00	11	266	224	335	135	199
SUSQ 44.5	08/05/93	15:05	10	169	24	73	135	132
SUSQ 44.5	10/21/93	12:00	488	129	4	36	312	359
SUSQ 44.5	12/16/93	10:30	113	769	125	186	329	563
SUSQ 44.5	04/21/94	11:15	116	1,200	96	154	44	510
SUSQ 44.5	06/15/94	9:30	10	908	6	267	134	457

APPENDIX B.

MACROINVERTEBRATE DATA FOR INTERSTATE STREAMS CROSSING THE NEW YORK-PENNSYLVANIA AND PENNSYLVANIA-MARYLAND BORDERS

TABLE B1. Macroinvertebrate Data for Susquehanna River at Windsor, N.Y., 1986-93

Order	Family	Genus	Individuals Collected
Coleoptera	Dytiscidae	Agabus *	
	Elmidae	Gonielmis *	
		Macronychus *	
		Optioservus	20
		Stenelmis	11
	Gyrinidae	Dineutis *	
	Psephenidae	Psephenus	2
Diptera	Rhagionidae	Atherix	1
	Chironomidae		11
	Empididae	Hemerodromia	3
	Simuliidae	Simulium	1
	Tipulidae	Antocha *	
Ephemeroptera	Baetidae	Baetis	7
		Centroptilum *	
		Heterocloeon	1
		Neocloeon *	
		Pseudocloeon	9
	Caenidae	Caenis *	
	Ephemerellidae	Ephemerella*	
		Serratella	15
	Heptageniidae	Heptagenia *	
		Rhithrogena *	
		Stenacron *	
		Stenonema	1
	Oligoneuriidae	Isonychia	1
	Polymitarcyidae	Ephoron *	
	Potamanthidae	Potamanthus	1
Megaloptera	Corydalidae	Corydalus *	
	Sialidae	Sialis *	
Plecoptera	Perlidae	Acroneuria *	
		Neoperla *	
		Paragnetina *	
		Phasganophora	1
	Perlodidae	Isoperla *	
Trichoptera	Hydropsychidae	Cheumatopsyche	2
		Hydropsyche	1
		Macronemum	8
		Symphitopsyche	10
	Hydroptilidae	Stactobiella *	
	Lepidostomatidae	Theliopsyche *	

TABLE B1. Macroinvertebrate Data for Susquehanna River at Windsor, N.Y., 1986-93 (Continued)

Order	Family	Genus	Individuals Collected
Trichoptera	Leptoceridae	Mystacides *	
	Limnephilidae	Frenesia *	
		Neophylax *	
	Philopotamidae	Chimarra	7
	Polycentropodidae	Neureclipsis *	
		Nyctiophylax *	
Amphipoda	Gammaridae	Gammarus *	
Decapoda	Cambaridae	Cambarus *	
Limnophila	Physidae	Physa *	
Pelecypoda	Sphaeriidae	Pisidium *	
Tricladida	Planariidae	Dugesia *	

* Taxa not collected in 1993

NUMBER OF TAXA: 1986-93: 51
1993: 20

RBP SCORE: 48
DIVERSITY INDEX: 3.68

TABLE B2. Macroinvertebrate Data for Snake Creek at Brookdale, Pa., 1986-93

Order	Family	Genus	Individuals Collected
Coleoptera	Elmidae	Macronychus *	
		Optioservus	8
		Stenelmis	2
	Hydrophilidae	Hydrobius *	
	Psephenidae	Psephenus	1
Diptera	Rhagionidae	Atherix	10
	Chironomidae		51
	Tipulidae	Antocha *	
		Hexatoma *	
		Tipula *	
Ephemeroptera	Baetidae	Baetis	13
		Centroptilum *	
		Heterocloeon *	
		Neocloeon *	
		Pseudocloeon	2
	Caenidae	Caenis	4
	Ephemerellidae	Ephemerella *	
		Serratella	1
	Ephemeridae	Ephemera *	
	Heptageniidae	Epeorus	1
		Heptagenia *	
		Ironodes *	
		Stenacron *	
		Stenonema	1
	Leptophlebiidae	Paraleptophlebia *	
	Oligoneuriidae	Isonychia	7
	Polymitarcyidae	Ephoron *	
	Potamanthidae	Potamanthus *	
	Siphlonuridae	Ameletus *	
	Tricorythidae	Tricorythodes *	
Megaloptera	Corydalidae	Corydalus *	
		Chauliodes *	
		Nigronia *	
	Sialidae	Sialis *	
Odonata	Gomphidae	Gomphus *	
		Ophiogomphus *	
Plecoptera	Leuctridae	Leuctra	3
	Nemouridae	Amphinemura *	

TABLE B2. Macroinvertebrate Data for Snake Creek at Brookdale, Pa., 1986-93 (Continued)

Order	Family	Genus	Individuals Collected
Plecoptera	Perlidae	Acroneuria *	
		Neoperla *	
		Paragnetina *	
		Phasganophora *	
	Perlodidae	Isoperla *	
	Pteronarcyidae	Pteronarcys *	
Trichoptera	Glossosomatidae	Glossosoma *	
	Hydropsychidae	Cheumatopsyche	4
		Hydropsyche *	
		Macronemum *	
		Parapsyche *	
		Symphitopsyche	16
	Hydroptilidae	Leucotrichia *	
	Leptoceridae	Mystacides *	
	Limnephilidae	Hydatophylax *	
	Philopotamidae	Chimarra	6
		Dolophilodes	8
	Polycentropodidae	Neureclipsis *	
Decapoda	Cambaridae	Cambarus *	
Haplotaxida	Naididae *		
Pelecypoda	Sphaeriidae	Pisidium *	

* Taxa not collected in 1993

NUMBER OF TAXA: 1986-93: 59
1993: 17

RBP SCORE: 38
DIVERSITY INDEX: 3.18

TABLE B3. Macroinvertebrate Data for Little Snake Creek at Brackney, Pa., 1988-93

Order	Family	Genus	Individuals Collected
Coleoptera	Elmidae	Optioservus	7
		Stenelmis	1
	Psephenidae	Psephenus	4
Diptera	Rhagionidae	Atherix	3
	Chironomidae		18
	Empididae	Hemerodromia	3
	Simuliidae	Simulium	1
	Tipulidae	Antocha *	
		Hexatoma *	
		Tipula *	
Ephemeroptera	Baetidae	Baetis	18
		Neocloeon *	
		Heterocloeon *	
		Pseudocloeon	1
	Caenidae	Caenis *	
	Ephemerellidae	Ephemerella *	
		Eurylophella *	
	Ephemeridae	Ephemera *	
	Heptageniidae	Epeorus *	
		Heptagenia *	
		Stenonema *	
	Leptophlebiidae	Paraleptophlebia *	
	Oligoneuriidae	Isonychia	12
Megaloptera	Corydalidae	Nigronia	3
	Sialidae	Sialis *	
Odonata	Aeshnidae	Boyeria	1
	Gomphidae	Gomphus	2
		Hagenius *	
		Ophiogomphus *	
Plecoptera	Leuctridae	Leuctra	3
	Perlidae	Acroneuria	1
		Paragnetina *	
		Phasganophora *	
Trichoptera	Glossosomatidae	Glossosoma *	
	Hydropsychidae	Cheumatopsyche	6
		Hydropsyche	1
		Macronemum	1
		Symphitopsyche	13

TABLE B3. Macroinvertebrate Data for Little Snake Creek at Brackney, Pa., 1988-93 (Continued)

Order	Family	Genus	Individuals Collected
	Philopotamidae	Chimarra	15
Decapoda	Cambaridae	Cambarus *	

* Taxa not collected in 1993

NUMBER OF TAXA: 1988-93: 40
1993: 20

RBP SCORE: 48
DIVERSITY INDEX: 3.64

TABLE B4. Macroinvertebrate Data for Susquehanna River at Kirkwood, N.Y., 1986-93

Order	Family	Genus	Individuals Collected
Coleoptera	Dytisicidae	Agabus *	
	Elmidae	Ancyronyx *	
		Dubiraphia *	
		Macronychus *	
		Optioservus	16
		Stenelmis	7
	Hydrophilidae	Berosus *	
	Psephenidae	Psephenus *	
	Ptilodactylidae	Anchytarsus *	
Diptera	Rhagionidae	Atherix *	
	Chironomidae		33
	Culicidae	Anopheles	5
	Tipulidae	Antocha *	
		Tipula *	
Ephemeroptera	Baetidae	Baetis	5
		Centroptilum *	
		Pseudocloeon *	
	Caenidae	Brachycercus *	
		Caenis	3
	Ephemerellidae	Serratella *	
	Heptageniidae	Heptagenia *	
		Leucrocuta	2
		Stenacron	1
		Stenonema	1
	Leptophlebiidae	Paraleptophlebia *	
	Oligoneuriidae	Isonychia*	
	Polymitarcyidae	Ephoron	3
	Potamanthidae	Potamanthus	7
	Tricorythidae	Tricorythodes*	
Lepidoptera	Pyralidae	Petrophila *	
Megaloptera	Corydalidae	Corydalus *	
Odonata	Coenagrionidae	Argia *	
	Gomphidae	Gomphus *	
Plecoptera	Perlidae	Neoperla	1
		Phasganophora *	
Trichoptera	Brachycentridae	Brachycentrus	25
	Glossosomatidae	Glossosoma*	
	Helicopsychidae	Helicopsyche *	

TABLE B4. Macroinvertebrate Data for Susquehanna River at Kirkwood, N.Y., 1986-93 (Continued)

Order	Family	Genus	Individuals Collected
	Hydropsychidae	Cheumatopsyche *	
		Hydropsyche *	
		Macronemum *	
Trichoptera	Hydropsychidae	Symphitopsyche *	
	Hydroptilidae	Stactobiella *	
	Lepidostomatidae	Lepidostoma *	
		Theliopsyche *	
	Leptoceridae	Ceraclea *	
	Limnephilidae	Hydatophylax *	
		Neophylax *	
		Pycnopsyche*	
	Philopotamidae	Chimarra*	
	Polycentropodidae	Neureclipsis *	
Hydracarina *			
Amphipoda	Gammaridae	Gammarus *	
Decapoda	Cambaridae	Cambarus *	
		Orconectes *	
Pelecypoda	Sphaeriidae	Musculium *	
		Pisidium	3
Haplotaxida	Naididae *		
Limnophila	Physidae	Physa *	
Tricladida	Planariidae	Dugesia*	

* Taxa not collected in 1993

NUMBER OF TAXA: 1986-93: 61
1993: 14

RBP SCORE: 32
DIVERSITY INDEX: 3.01

TABLE B5. Macroinvertebrate Data for Choconut Creek at Vestal Center, N.Y., 1988-93

Order	Family	Genus	Individuals Collected
Coleoptera	Elmidae	Optioservus	5
		Stenelmis	5
	Gyrinidae	Dineutis *	
	Psephenidae	Psephenus	1
Diptera	Rhagionidae	Atherix	7
	Chironomidae		24
	Empididae	Hemerodromia *	
	Tipulidae	Antocha	1
		Hexatoma *	
		Tipula *	
Ephemeroptera	Baetidae	Baetis	5
		Pseudocloeon *	
	Caenidae	Caenis	4
	Ephemerellidae	Ephemerella *	
		Serratella *	
	Heptageniidae	Epeorus	1
		Heptagenia *	
		Leucrocuta	1
		Stenacron *	
		Stenonema *	
	Leptophlebiidae	Leptophlebia *	
		Paraleptophlebia	1
	Oligoneuriidae	Isonychia	13
Megaloptera	Corydalidae	Nigronia *	
	Sialidae	Sialis	1
Odonata	Gomphidae	Gomphus *	
		Ophiogomphus *	
Plecoptera	Leuctridae	Leuctra	4
	Perlidae	Acroneuria *	
		Phasganophora	2
	Perlodidae	Isoperla *	
Trichoptera	Glossosomatidae	Glossosoma *	
	Hydropsychidae	Cheumatopsyche	5
		Hydropsyche	1
		Symphitopsyche	24
	Limnephilidae	Hydatophylax *	
		Neophylax *	
	Philopotamidae	Chimarra	19
		Dolophilodes *	

TABLE B5. Macroinvertebrate Data for Choconut Creek at Vestal Center, N.Y., 1988-93 (Continued)

Order	Family	Genus	Individuals Collected
Trichoptera	Polycentropodidae	Neureclipsis *	
	Rhyacophilidae	Rhyacophila *	
Decapoda	Cambaridae	Orconectes *	

* Taxa not collected in 1993

NUMBER OF TAXA: 1988-93: 42
1993: 19

RBP SCORE: 48
DIVERSITY INDEX: 3.46

TABLE B6. Macroinvertebrate Data for Apalachin Creek at Little Meadows, Pa., 1988-93

Order	Family	Genus	Individuals Collected
Coleoptera	Elmidae	Ordobrevia *	
		Optioservus	9
		Stenelmis	20
	Hydrophilidae	Laccobius *	
	Psephenidae	Psephenus	2
Diptera	Chironomidae		39
	Simuliidae	Simulium *	
	Tipulidae	Hexatoma *	
		Tipula *	
Ephemeroptera	Baetidae	Baetis *	
		Centroptilum *	
	Caenidae	Caenis	2
	Ephemerellidae	Serratella	1
	Heptageniidae	Heptagenia *	
		Leucrocuta	1
		Stenacron *	
		Stenonema	1
	Leptophlebiidae	Paraleptophlebia *	
	Oligoneuriidae	Isonychia	1
Megaloptera	Corydalidae	Corydalus *	
		Nigronia *	
	Sialidae	Sialis *	
Odonata	Gomphidae	Gomphus *	
		Ophiogomphus *	
Plecoptera	Leuctridae	Leuctra *	
	Perlidae	Acroneuria *	
		Paragnetina *	
		Phasgonaphora *	
	Perlodidae	Isoperla *	
Trichoptera	Glossosomatidae	Glossosoma *	
	Hydropsychidae	Cheumatopsyche	13
		Hydropsyche	5
		Symphitopsyche *	
	Philopotamidae	Chimarra	15
		Dolophilodes *	
	Rhyacophilidae	Rhyacophila *	
Decapoda	Cambaridae	Cambarus *	
		Orconectes *	

TABLE B6. Macroinvertebrate Data for Apalachin Creek at Little Meadows, Pa., 1988-93 (Continued)

Order	Family	Genus	Individuals Collected
Hemiptera	Gerridae	Gerris *	
Pelecypoda	Sphaeriidae	Musculium *	

* Taxa not collected in 1993

NUMBER OF TAXA: 1988-93: 40
1993: 12

RBP SCORE: 30
DIVERSITY INDEX: 2.70

TABLE B7. Macroinvertebrate Data for Wappasening Creek at Nichols, N.Y., 1988-93

Order	Family	Genus	Individuals Collected
Coleoptera	Carabidae *		
	Elmidae	Optioservus	5
		Stenelmis	5
	Gyrinidae	Dineutis *	
	Hydrophilidae	Laccobius *	
	Psephenidae	Ectopria *	
		Psephenus	3
Diptera	Rhagionidae	Atherix	2
	Chironomidae		55
	Empididae	Hemerodromia	1
	Tipulidae	Antocha *	
		Hexatoma *	
		Limonia *	
		Tipula *	
Ephemeroptera	Baetidae	Baetis	35
	Caenidae	Caenis *	
	Ephemerellidae	Ephemerella *	
		Serratella	6
	Ephemeridae	Ephemera *	
	Heptageniidae	Epeorus	2
		Heptagenia *	
		Leucrocuta	4
		Stenacron *	
		Stenonema	17
	Leptophlebiidae	Leptophlebia *	
	Oligoneuriidae	Isonychia	7
	Tricorythidae	Tricorythodes *	
Megaloptera	Corydalidae	Corydalus *	
		Nigronia *	
	Sialidae	Sialis *	
Odonata	Aeshnidae	Boyeria *	
	Coenagrionidae	Argia *	
	Gomphidae	Gomphus *	
		Hagenius *	
		Ophiogomphus *	
		Stylogomphus *	
Plecoptera	Perlidae	Acroneuria *	
		Neoperla *	
		Paragnetina *	
		Phasganophora *	

TABLE B7. Macroinvertebrate Data for Wappasening Creek at Nichols, N.Y., 1988-93 (Continued)

Order	Family	Genus	Individuals Collected
Trichoptera	Glossosomatidae	Glossosoma *	
	Hydropsychidae	Cheumatopsyche	6
		Hydropsyche *	
		Symphitopsyche	18
	Hydroptilidae	Stactobiella *	
	Leptoceridae	Mystacides *	
	Limnophilidae	Neophylax *	
	Philopotamidae	Chimarra	9
	Polycentropodidae	Neureclipsis *	
		Polycentropus *	
Decapoda	Cambaridae	Orconectes *	
Limnophila	Physidae	Physa *	

* Taxa not collected in 1993

NUMBER OF TAXA: 1988-93: 52
1993: 15

RBP SCORE: 34
DIVERSITY INDEX: 3.10

TABLE B8. Macroinvertebrate Data for Cayuta Creek at Waverly, N.Y., 1986-93

Order	Family	Genus	Individuals Collected
Coleoptera	Elmidae	Optioservus	5
		Stenelmis	8
	Gyrinidae	Dineutus *	
	Psephenidae	Psephenus	1
Diptera	Rhagionidae	Atherix	1
	Chironomidae		54
	Empididae	Hemerodromia *	
	Simuliidae	Simulium *	
	Tipulidae	Antocha *	
		Hexatoma	1
		Tipula *	
Ephemeroptera	Baetidae	Baetis	19
		Centroptilum *	
		Heterocloeon *	
		Pseudocloeon	1
	Caenidae	Caenis *	
	Ephemerellidae	Ephemerella *	
		Serratella	5
	Heptageniidae	Epeorus	2
		Heptagenia *	
		Leucrocuta	13
		Stenacron	1
		Stenonema	13
	Oligoneuriidae	Isonychia	9
	Polymitarcyidae	Ephoron	1
	Tricorythidae	Tricorythodes *	
Lepidoptera	Pyralidae	Petrophila *	
Megaloptera	Corydalidae	Corydalus *	
	Sialidae	Sialis *	
Odonata	Coenagrionidae	Argia *	
Plecoptera	Perlidae	Acroneuria	1
		Paragnetina *	
		Phasganophora	1
	Perlodidae	Isoperla *	
		Cultus *	
Trichoptera	Brachycentridae	Brachycentrus *	
	Glossosomatidae	Glossosoma*	
	Hydropsychidae	Cheumatopsyche	8
		Hydropsyche *	

TABLE B8. Macroinvertebrate Data for Cayuta Creek at Waverly, N.Y., 1986-93 (Continued)

Order	Family	Genus	Individuals Collected
Trichoptera	Hydropsychidae	Macronemum *	
		Symphitopsyche	15
	Hydroptilidae	Leucotrichia *	
		Stactobiella *	
	Limnephilidae	Pycnopsyche*	
	Philopotamidae	Chimarra	3
	Polycentropodidae	Nyctiophylax *	
Decapoda	Cambaridae	Orconectes *	
Hydracarina *			
Isopoda	Asellidae	Asellus *	
Limnophila	Physidae	Physa *	
Tricladida	Planariidae	Dugesia *	

* Taxa not collected in 1993

NUMBER OF TAXA: 1986-93: 51
1993: 20

RBP SCORE; 38
DIVERSITY INDEX: 3.31

TABLE B9. Macroinvertebrate Data for Troups Creek at Austinburg, Pa., 1988-93

Order	Family	Genus	Individuals Collected
Coleoptera	Elmidae	Optioservus	1
		Stenelmis *	
	Gyrinidae	Dineutis *	
	Hydrophilidae	Berosus *	
	Psephenidae	Psephenus	1
Diptera	Rhagionidae	Atherix	20
	Chironomidae		21
	Empididae	Hemerodromia *	
	Tipulidae	Hexatoma	1
		Tipula *	
Ephemeroptera	Baetidae	Baetis *	
		Pseudocloeon *	
	Caenidae	Caenis	3
	Heptageniidae	Heptagenia *	
		Stenacron *	
		Stenonema	1
	Oligoneuriidae	Isonychia	1
	Tricorythidae	Leptohyphes *	
		Tricorythodes *	
Megaloptera	Corydalidae	Nigronia *	
	Sialidae	Sialis *	
Odonata	Aeshnidae	Boyeria *	
	Coenagrionidae	Argia *	
	Gomphidae	Gomphus	1
		Hagenius *	
		Ophiogomphus *	
		Stylogomphus *	
Plecoptera	Leuctridae	Leuctra *	
	Perlidae	Neoperla *	
		Phasganophora *	
Trichoptera	Hydropsychidae	Cheumatopsyche	1
		Hydropsyche *	
		Potamyia *	
		Symphitopsyche	1
	Hydroptilidae	Stactobiella *	
	Leptoceridae	Mystacides *	
	Philopotamidae	Dolophilodes *	
Limnophila	Physidae	Physa *	

TABLE B9. Macroinvertebrate Data for Troups Creek at Austinburg, Pa., 1988-93 (Continued)

Order	Family	Genus	Individuals Collected
Limnophila	Planorbidae	Gyraulus *	
Pelecypoda	Sphaeriidae	Pisidium *	

* Taxa not collected in 1993

NUMBER OF TAXA: 1988-93: 40
1993: 11

RBP SCORE: 22
DIVERSITY INDEX: 2.17

TABLE B10. Macroinvertebrate Data for Cowanesque River at Lawrenceville, Pa., 1988-93

Order	Family	Genus	Individuals Collected
Coleoptera	Elmidae	Stenelmis	1
		Macronychus *	
	Hydrophilidae	Berosus *	
Diptera	Rhagionidae	Atherix *	
	Chironomidae		15
	Empididae	Hemerodromia *	
	Simuliidae	Simulium	1
	Tipulidae	Antocha *	
Ephemeroptera	Baetidae	Pseudocloeon *	
	Caenidae	Caenis *	
	Heptageniidae	Heptagenia *	
		Stenonema *	
Megaloptera	Corydalidae	Corydalus *	
Odonata	Coenagrionidae	Argia *	
Trichoptera	Brachycentridae	Brachycentrus *	
	Glossosomatidae	Glossosoma *	
	Hydropsychidae	Cheumatopsyche	1
		Hydropsyche *	
		Symphitopsyche *	
	Hydroptilidae	Stactobiella *	
	Philopotamidae	Chimarra	1
	Polycentropodidae	Nyctiophylax *	
		Polycentropus *	
Decapoda	Cambaridae	Orconectes *	
Isopoda	Asellidae	Asellus	71
Pelecypoda	Sphaeriidae *		
Tricladida	Planariidae	Dugesia *	

* Taxa not collected in 1993

NUMBER OF TAXA: 1988-93: 37
1993: 6

RBP SCORE: 8
DIVERSITY INDEX: 0.99

TABLE B11. Macroinvertebrate Data for Tioga River at Lindley, N.Y., 1986-93

Order	Family	Genus	Individuals Collected
Coleoptera	Elmidae	Stenelmis	2
	Gyrinidae	Dineutis *	
	Hydrophilidae	Berosus *	
	Psephenidae	Psephenus *	
Diptera	Rhagionidae	Atherix	1
	Chironomidae		27
	Empididae	Hemerodromia *	
	Simuliidae	Simulium	5
	Tipulidae	Antocha *	
		Tipula *	
Ephemeroptera	Baetidae	Baetis	2
		Heterocloeon *	
		Pseudocloeon	6
	Caenidae	Caenis	3
	Ephemerellidae	Serratella *	
	Heptageniidae	Stenacron *	
		Stenonema	14
	Oligoneuriidae	Isonychia	13
	Potamanthidae	Potamanthus	1
	Siphlonuridae	Ameletus *	
	Tricorythidae	Tricorythodes *	
Megaloptera	Corydalidae	Corydalus *	
		Nigronia	1
Neuroptera	Sisyridae	Climacia *	
Odonata	Coenagrionidae	Argia *	
	Gomphidae	Gomphus *	
		Ophiogomphus *	
Plecoptera	Perlidae	Acroneuria *	
		Perlesta *	
	Perlodidae	Isoperla *	
Trichoptera	Glossosomatidae	Glossosoma *	
	Hydropsychidae	Cheumatopsyche	9
		Hydropsyche *	
		Macronemum	1
		Symphitopsyche	25
	Hydroptilidae	Agraylea *	
		Dibusa *	
		Hydroptila *	
	Philopotamidae	Chimarra	14
	Polycentropodidae	Neureclipsis	1

TABLE B11. Macroinvertebrate Data for Tioga River at Lindley, N.Y., 1986-93 (Continued)

Order	Family	Genus	Individuals Collected
Trichoptera	Polycentropodidae	Nyctiophylax *	
Amphipoda	Gammaridae	Gammarus *	
Hemiptera	Gerridae	Gerris *	
Rhynchobdellida	Glossiphoniidae	Batracobdella *	
Pelecypoda	Sphaeriidae	Pisidium	2
Isopoda	Asellidae	Asellus *	
Haplotaxida	Naididae *		

* Taxa not collected in 1993

NUMBER OF TAXA: 1986-93: 47
1993: 17

RBP SCORE: 46
DIVERSITY INDEX: 3.32

TABLE B12. Macroinvertebrate Data for Seeley Creek at Seeley Creek, N.Y., 1986-93

Order	Family	Genus	Individuals Collected
Coleoptera	Dytiscidae	Agabus	9
	Elmidae	Optioservus	4
		Stenelmis	3
	Gyrinidae	Dineutis *	
		Gyrinus *	
	Psephenidae	Psephenus	8
Diptera	Rhagionidae	Atherix	3
	Chironomidae		23
	Empididae	Hemerodromia *	
	Simuliidae	Simulium *	
	Tipulidae	Antocha *	
		Hexatoma *	
		Limonia *	
		Tipula	1
Ephemeroptera	Baetidae	Baetis *	
		Centroptilum *	
		Cloeon *	
		Pseudocloeon *	
	Caenidae	Caenis *	
	Ephemerellidae	Drunella *	
		Ephemerella *	
		Eurylophella *	
		Serratella *	
	Ephemeridae	Ephemera *	
	Heptageniidae	Epeorus *	
		Heptagenia *	
		Leucrocuta	5
		Stenacron *	
		Stenonema *	
	Leptophlebiidae	Leptophlebia *	
		Paraleptophlebia *	
	Oligoneuriidae	Isonychia *	
	Siphlonuridae	Siphlonurus *	
	Tricorythidae	Leptohyphes *	
		Tricorythodes	15
Megaloptera	Corydalidae	Nigronia *	
	Sialidae	Sialis *	
Odonata	Gomphidae	Erpetogomphus *	
		Gomphus *	
		Ophiogomphus *	

TABLE B12. Macroinvertebrate Data for Seeley Creek at Seeley Creek, N.Y., 1986-93 (Continued)

Order	Family	Genus	Individuals Collected
Odonata	Gomphidae	Stylogomphus *	
Plecoptera	Leuctridae	Leuctra *	
	Nemouridae	Amphinemura *	
	Perlidae	Acroneuria *	
		Phasganophora *	
	Perlodidae	Isoperla *	
Trichoptera	Brachycentridae	Brachycentrus *	
	Glossosomatidae	Glossosoma *	
	Hydropsychidae	Cheumatopsyche *	
		Hydropsyche *	
		Symphitopsyche	18
	Hydroptilidae	Leucotrichia	4
		Stactobiella *	
	Philopotamidae	Chimarra	3
	Polycentropodidae	Neureclipsis *	
Limnophila	Physidae	Physa *	
	Planorbidae	Gyraulus *	
Lumbriculida	Lumbriculidae	Rhynchelmis *	

* Taxa not collected in 1993

NUMBER OF TAXA: 1986-93: 58
1993: 12

RBP SCORE: 34
DIVERSITY INDEX: 3.13

TABLE B13. Macroinvertebrate Data for South Creek at Fassett, Pa., 1988-93

Order	Family	Genus	Individuals Collected
Coleoptera	Elmidae	Dubiraphia *	
		Optioservus *	
		Stenelmis	13
	Psephenidae	Psephenus	3
Diptera	Rhagionidae	Atherix	1
	Chironomidae		51
	Empididae	Hemerodromia *	
	Simuliidae	Simulium *	
	Tabanidae	Chrysops	1
	Tipulidae	Antocha *	
Ephemeroptera	Baetidae	Baetis	2
		Pseudocloeon *	
	Caenidae	Caenis *	
	Ephemeridae	Ephemera *	
	Heptageniidae	Epeorus *	
		Heptagenia *	
		Leucrocuta *	
		Stenonema	4
	Leptophlebiidae	Leptophlebia *	
		Paraleptophlebia *	
	Oligoneuriidae	Isonychia	2
	Tricorythidae	Tricorythodes *	
Megaloptera	Corydalidae	Corydalus *	
		Nigronia *	
	Sialidae	Sialis	5
Odonata	Aeshnidae	Boyeria *	
	Gomphidae	Gomphus *	
		Ophiogomphus *	
Plecoptera	Leuctridae	Leuctra	5
	Perlidae	Acroneuria *	
		Neoperla *	
		Phasganophora *	
Trichoptera	Brachycentridae	Brachycentrus *	
	Hydropsychidae	Cheumatopsyche	36
		Hydropsyche	6
		Macronemum *	
		Symphitopsyche	2
	Hydroptilidae	Stactobiella *	

TABLE B13. Macroinvertebrate Data for South Creek at Fassett, Pa., 1988-93 (Continued)

Order	Family	Genus	Individuals Collected
Trichoptera	Philopotamidae	Chimarra	11
	Polycentropodidae	Neureclipsis *	
		Nyctiophylax *	
Hydracarina *			
Collembola *			
Decapoda	Cambaridae	Orconectes *	
Hemiptera	Veliidae	Microvelia *	
Limnophila	Physidae	Physa *	
Pelecypoda	Sphaeriidae *		
Tricladida	Planariidae	Dugesia *	

* Taxa not collected in 1993

NUMBER OF TAXA: 1988-93: 48
1993: 14

RBP SCORE: 30
DIVERSITY INDEX: 2.79

TABLE B14. Macroinvertebrate Data for Bentley Creek at Wellsburg, N.Y., 1986-93

Order	Family	Genus	Individuals Collected
Coleoptera	Elmidae	Optioservus	1
		Stenelmis *	
	Hydrophilidae	Tropisternus *	
	Psephenidae	Psephenus *	
Diptera	Athericidae	Atherix	3
	Chironomidae		19
	Empididae	Hemerodromia *	
	Simuliidae	Simulium *	
	Tabanidae	Chrysops *	
	Tipulidae	Hexatoma *	
		Tipula *	
Ephemeroptera	Baetidae	Baetis *	
		Centroptilum	1
		Pseudocloeon *	
	Baetiscidae	Baetisca	1
	Caenidae	Caenis *	
	Heptageniidae	Epeorus *	
		Heptagenia *	
		Stenacron	2
		Stenonema	5
	Leptophlebiidae	Leptophlebia *	
		Paraleptophlebia *	
	Oligoneuriidae	Isonychia	8
	Potamanthidae	Potamanthus *	
	Tricorythidae	Tricorythodes *	
Megaloptera	Corydalidae	Nigronia *	
	Sialidae	Sialis *	
Odonata	Gomphidae	Gomphus *	
		Ophiogomphus *	
		Stylogomphus *	
Plecoptera	Capniidae	Paracapnia *	
	Leuctridae	Leuctra	2
	Perlidae	Acroneuria *	
		Paragnetina *	
		Phasganophora *	
Trichoptera	Glossosomatidae	Glossosoma	1
	Hydropsychidae	Cheumatopsyche	13
		Hydropsyche	1
		Symphitopsyche	27
	Hydroptilidae	Stactobiella *	

TABLE B14. Macroinvertebrate Data for Bentley Creek at Wellsburg, N.Y., 1986-93 (Continued)

Order	Family	Genus	Individuals Collected
Trichoptera	Leptoceridae	Mystacides *	
	Odontoceridae	Psilotreta *	
	Philopotamidae	Chimarra	1
	Polycentropodidae	Neureclipsis *	
Decapoda	Cambaridae	Cambarus *	
Haplotaxida	Naididae		1
Limnophila	Physidae	Physa *	
	Planorbidae	Gyraulus *	

* Taxa not collected in 1993

NUMBER OF TAXA: 1988-93: 48
1993: 15

RBP SCORE: 38
DIVERSITY INDEX: 2.92

TABLE B15. Macroinvertebrate Data for Chemung River at Chemung, N.Y., 1986-93

Order	Family	Genus	Individuals Collected
Coleoptera	Elmidae	Dubiraphia *	
		Optioservus	3
		Stenelmis	1
	Gyrinidae	Dineutis *	
	Hydrophilidae	Berosus *	
	Psephenidae	Ectopria *	
		Psephenus *	
	Ptilodactylidae	Anchytarsus *	
Diptera	Athericidae	Atherix	3
	Chironomidae		23
	Empididae	Hemerodromia *	
	Simuliidae	Simulium *	
Ephemeroptera	Baetidae	Baetis *	
		Pseudocloeon *	
	Caenidae	Caenis *	
	Ephemerellidae	Serratella *	
	Ephemeridae	Ephemera *	
	Heptageniidae	Heptagenia *	
		Stenacron *	
		Stenonema	3
	Leptophlebiidae	Paraleptophlebia *	
	Oligoneuriidae	Isonychia	9
	Polymitarcyidae	Ephoron *	
	Potamanthidae	Potamanthus *	
	Siphlonuridae	Parameletus *	
	Tricorythidae	Tricorythodes *	
Lepidoptera	Pyralidae	Petrophila *	
Megaloptera	Sialidae	Sialis *	
Odonata	Coenagrionidae	Argia *	
		Nehallenia *	
	Gomphidae	Gomphus *	
		Ophiogomphus *	
Plecoptera	Perlidae	Acroneuria *	
		Neoperla *	
	Perlodidae	Isoperla *	
Trichoptera	Helicopsychidae	Helicopsyche *	
	Hydropsychidae	Cheumatopsyche	14
		Hydropsyche	11
		Symphitopsyche *	

TABLE B15. Macroinvertebrate Data for Chemung River at Chemung, N.Y., 1986-93 (Continued)

Order	Family	Genus	Individuals Collected
Trichoptera	Hydroptilidae	Dibusa *	
	Limnephilidae	Hydatophylax *	
		Pycnopsyche *	
	Philopotamidae	Chimarra	1
	Polycentropodidae	Neureclipsis *	
		Nyctiophylax *	
Amphipoda	Talitridae	Hyalella *	
Hemiptera	Notonectidae	Notonecta *	
	Veliidae	Rhagovelia *	
Decapoda	Cambaridae	Cambarus *	
		Orconectes *	
Pelecypoda	Sphaeriidae	Musculium	52
Limnophila	Physidae	Physa *	
Rhynchobdellida	Glossiphoniidae	Batrachobdella *	
Tricladida	Planariidae	Dugesia *	

* Taxa not collected in 1993

NUMBER OF TAXA: 1986-93: 54
1993: 10

RBP SCORE: 20
DIVERSITY INDEX: 2.45

TABLE B16. Macroinvertebrate Data for Susquehanna River at Sayre, Pa., 1986-93

Order	Family	Genus	Individuals Collected
Coleoptera	Elmidae	Optioservus	5
		Stenelmis	23
	Gyrinidae	Dineutis *	
	Hydrophilidae	Berosus *	
	Psephenidae	Ectopria	1
		Psephenus	4
Diptera	Rhagionidae	Atherix *	
	Chironomidae		14
	Empididae	Hemerodromia *	
	Simuliidae	Simulium *	
	Tipulidae	Limonia *	
Ephemeroptera	Baetidae	Baetis *	
		Centroptilum	3
		Pseudocloeon *	
	Caenidae	Caenis *	
	Ephemerellidae	Ephemerella *	
		Serratella	8
	Heptageniidae	Heptagenia *	
		Rhithrogena *	
		Stenacron *	
		Stenonema	7
	Leptophlebiidae	Leptophlebia *	
	Oligoneuriidae	Isonychia	21
	Polymitarcyidae	Ephoron	2
	Potamanthidae	Potamanthus	1
	Tricorythidae	Tricorythodes *	
Hemiptera	Gerridae	Metrobates *	
Lepidoptera	Pyralidae	Petrophila *	
Odonata	Coenagrionidae	Argia *	
	Gomphidae	Gomphus *	
Plecoptera	Leuctridae	Leuctra *	
	Perlidae	Neoperla *	
		Phasganophora	1
Trichoptera	Hydropsychidae	Cheumatopsyche	3
		Hydropsyche	1
		Macronemum	1
		Symphitopsyche	1
	Hydroptilidae	Ochrotrichia *	
	Philopotamidae	Chimarra	3

TABLE B16. Macroinvertebrate Data for Susquehanna River at Sayre, Pa., 1986-93 (Continued)

Order	Family	Genus	Individuals Collected
Amphipoda	Gammaridae	Gammarus	3
Annelida	Hirudinea *		
Decapoda	Cambaridae	Cambarus *	
		Orconectes *	
Pelecypoda	Sphaeriidae	Pisidium	7
Tricladida	Planariidae	Dugesia *	
Limnophila	Physidae	Physa *	

* Taxa not collected in 1993

NUMBER OF TAXA: 1986-93: 46
1993: 19

RBP SCORE: 44
DIVERSITY INDEX: 3.52

TABLE B17. Macroinvertebrate Data for South Branch Conewago Creek at Bandanna, Pa., 1988-93

Order	Family	Genus	Individuals Collected
Coleoptera	Elmidae	Optioservus	13
		Stenelmis	2
	Psephenidae	Psephenus	2
		Ectopria *	
Diptera	Athericidae	Atherix	3
	Chironomidae		12
	Dixidae	Dixa *	
	Simuliidae	Simulium *	
	Tabanidae	Chrysops *	
	Tipulidae	Antocha *	
		Hexatoma	1
		Pedicia *	
		Tipula	2
Ephemeroptera	Baetidae	Baetis	3
		Centroptilum *	
	Ephemerellidae	Ephemerella *	
		Serratella	2
	Heptageniidae	Heptagenia *	
		Stenonema	12
	Leptophlebiidae	Paraleptophlebia *	
Megaloptera	Corydalidae	Nigronia	9
	Sialidae	Sialis	1
Odonata	Aeshnidae	Boyeria *	
	Coenagrionidae	Argia *	
	Gomphidae	Gomphus	6
		Hagenius	1
		Stylogomphus *	
Plecoptera	Leuctridae	Leuctra	3
	Peltoperlidae	Peltoperla	2
	Perlidae	Acroneuria	7
		Phasganophora *	
	Perlodidae	Isoperla *	
Trichoptera	Glossosomatidae	Glossosoma	7
	Hydropsychidae	Cheumatopsyche	3
		Hydropsyche	2
		Potamyia *	
		Symphitopsyche	8

TABLE B17. Macroinvertebrate Data for South Branch Conewago Creek at Bandanna, Pa., 1988-93 (Continued)

Order	Family	Genus	Individuals Collected
Trichoptera	Limnophilidae	Neophylax	1
	Philopotamidae	Chimarra *	
		Dolophilodes	5
	Polycentropodidae	Polycentropus *	
Hemiptera	Veliidae	Rhagovelia	2
Hydracarina *			
Decapoda	Cambaridae	Cambarus *	
		Orconectes	1
		Procambarus *	

* Taxa not collected in 1993

NUMBER OF TAXA: 1988-93: 46
1993: 25

RBP SCORE: 48
DIVERSITY INDEX: 4.18

TABLE B18. Macroinvertebrate Data for Long Arm Creek at Bandanna, Pa., 1988-93

Order	Family	Genus	Individuals Collected
Coleoptera	Elmidae	Ancyronyx *	
		Macronychus *	
		Optioservus	19
		Stenelmis	5
	Psephenidae	Psephenus	1
Diptera	Athericidae	Atherix *	
	Chironomidae		15
	Empididae	Hemerodromia	6
	Simuliidae	Simulium	2
	Tipulidae	Antocha	3
		Hexatoma	4
		Tipula *	
Ephemeroptera	Baetidae	Baetis	36
		Heterocloeon *	
	Caenidae	Caenis *	
	Ephemerellidae	Serratella	4
	Ephemeridae	Ephemera *	
	Heptageniidae	Epeorus *	
		Heptagenia *	
		Stenacron *	
		Stenonema	5
	Leptophlebiidae	Leptophlebia	1
		Paraleptophlebia *	
	Oligoneuriidae	Isonychia *	
Megaloptera	Corydalidae	Nigronia *	
	Sialidae	Sialis	1
Plecoptera	Leuctridae	Leuctra	14
	Perlidae	Phasganophora *	
Trichoptera	Glossosomatidae	Glossosoma	1
	Hydropsychidae	Cheumatopsyche	5
		Hydropsyche	15
		Symphitopsyche	4
	Limnephilidae	Goera	1
Decapoda	Cambaridae	Cambarus *	
		Orconectes *	
Limnophila	Physidae	Physa	1
Pelecypoda	Sphaeriidae	Pisidium	1

* Taxa not collected in 1993

NUMBER OF TAXA: 1988-93: 37
1993: 21

RBP SCORE: 40
DIVERSITY INDEX: 3.57

TABLE B19. Macroinvertebrate Data for Susquehanna River at Marietta, Pa., 1986-93

Order	Family	Genus	Individuals Collected
Coleoptera	Elmidae	Dubiraphia *	
		Optioservus *	
		Macronychus *	
		Stenelmis	21
	Psephenidae	Psephenus *	
Diptera	Chironomidae		10
	Empididae	Hemerodromia *	
	Simuliidae	Simulium *	
Ephemeroptera	Baetidae	Baetis	8
		Centroptilum	1
		Heterocloeon *	
		Pseudocloeon	2
	Caenidae	Caenis	3
	Ephemerellidae	Serratella	1
	Heptageniidae	Heptagenia	1
		Leucrocuta	4
		Stenacron *	
		Stenonema	28
	Leptophlebiidae	Leptophlebia	1
	Oligoneuriidae	Isonychia	5
	Polymitarcyidae	Ephoron *	
	Potamanthidae	Potamanthus	2
	Siphlonuridae	Ameletus *	
	Tricorythidae	Leptohyphes *	
		Tricorythodes	1
Lepidoptera	Pyralidae	Petrophila *	
Megaloptera	Corydalidae	Corydalus	3
		Nigronia *	
	Sialidae	Sialis *	
Odonata	Coenagrionidae	Argia	3
Trichoptera	Hydropsychidae	Cheumatopsyche	3
		Hydropsyche *	
		Macronemum	8
		Symphitopsyche	1
	Hydroptilidae	Leucotrichia *	
		Stactobiella *	
	Philopotamidae	Chimarra	7
	Polycentropodidae	Nyctiophylax *	
Amphipoda	Gammaridae	Gammarus *	
Decapoda	Cambaridae	Cambarus *	

TABLE B19. Macroinvertebrate Data for Susquehanna River at Marietta, Pa., 1986-93 (Continued)

Order	Family	Genus	Individuals Collected
Decapoda	Cambaridae	Orconectes	1
		Procambarus *	
Pelecypoda	Corbiculidae	Corbicula	1
	Sphaeriidae	Musculium *	
		Pisidium	7
Limnophila	Physidae	Physa *	
Lumbriculida	Lumbriculidae	Rhynchelmis *	
Tricladida	Planariidae	Dugesia *	

* Taxa not collected in 1993

NUMBER OF TAXA: 1986-93: 48
1993: 23

RBP SCORE: 46
DIVERSITY INDEX: 3.73

TABLE B20. Macroinvertebrate Data for Scott Creek at Delta, Pa., 1989-93

Order	Family	Genus	Individuals Collected
Coleoptera	Dytiscidae	Agabus *	
	Elmidae	Optioservus *	
Diptera	Athericidae	Atherix	1
	Chironomidae		57
	Empididae	Hemerodromia	4
	Simuliidae	Simulium	19
	Tabanidae	Chrysops *	
		Tabanus *	
	Tipulidae	Antocha *	
		Pedicia *	
		Tipula	2
Ephemeroptera	Baetidae	Baetis	18
Odonata	Aeshnidae	Boyeria *	
	Gomphidae	Gomphus *	
Trichoptera	Glossosomatidae	Glossosoma *	
	Hydropsychidae	Cheumatopsyche *	
		Hydropsyche	5
		Symphitopsyche	1
Decapoda	Cambaridae	Cambarus *	
Isopoda	Asellidae	Asellus	1
Limnophila	Physidae	Physa	3
Haplotaxida	Naididae	Nais *	

* Taxa not collected in 1993

NUMBER OF TAXA: 1989-93: 22
1993: 10

RBP SCORE: 12
DIVERSITY INDEX: 2.16

TABLE B21. Macroinvertebrate Data for Conowingo Creek at Pleasant Grove, Pa., 1986-93

Order	Family	Genus	Individuals Collected
Coleoptera	Elmidae	Macronychus *	
		Ordobrevia *	
		Optioservus *	
		Stenelmis	7
	Hydrophilidae	Berosus *	
	Psephenidae	Psephenus *	
Diptera	Athericidae	Atherix	4
	Chironomidae		15
	Empididae	Hemerodromia *	
	Simuliidae	Simulium	1
	Tipulidae	Antocha *	
		Tipula *	
Ephemeroptera	Baetidae	Baetis	12
		Pseudocloeon	1
	Caenidae	Caenis *	
	Ephemerellidae	Serratella	18
	Heptageniidae	Heptagenia *	
		Leucrocuta	6
		Stenacron *	
		Stenonema	8
	Leptophlebiidae	Paraleptophlebia *	
	Oligoneuriidae	Isonychia	4
	Siphlonuridae	Ameletus *	
	Tricorythidae	Leptohyphes *	
Megaloptera	Corydalidae	Corydalus	1
		Chauliodes *	
		Nigronia *	
	Sialidae	Sialis *	
Odonata	Coenagrionidae	Argia *	
Plecoptera	Leuctridae	Leuctra *	
Trichoptera	Brachycentridae	Micrasema *	
	Hydropsychidae	Cheumatopsyche	5
		Hydropsyche	3
		Macronemum	1
		Symphitopsyche	43
	Hydroptilidae	Leucotrichia *	
	Philopotamidae	Chimarra *	
	Psychomyiidae	Lype *	
Hydracarina *			
Decapoda	Cambaridae	Cambarus *	

TABLE B21. Macroinvertebrate Data for Conowingo Creek at Pleasant Grove, Pa., 1986-93 (Continued)

Order	Family	Genus	Individuals Collected
Decapoda	Cambaridae	Orconectes *	
	Asellidae	Asellus *	
	Lumbriculidae	Rhynchelmis *	
Isopoda	Corbiculidae	Corbicula *	

* Taxa not collected in 1993

NUMBER OF TAXA: 1986-93: 44
1993: 15

RBP SCORE: 32
DIVERSITY INDEX: 3.12

TABLE B22. Macroinvertebrate Data for Octoraro Creek at Rising Sun, Md., 1986-93

Order	Family	Genus	Individuals Collected
Coleoptera	Elmidae	Optioservus	1
		Stenelmis	8
	Psephenidae	Psephenus	2
Diptera	Chironomidae		20
	Empididae	Hemerodromia *	
	Simuliidae	Simulium	1
	Tipulidae	Antocha *	
Ephemeroptera	Baetidae	Baetis	35
		Heterocloeon *	
		Neocloeon *	
		Pseudocloeon	7
	Caenidae	Caenis	1
	Ephemerellidae	Ephemerella *	
		Serratella	7
	Heptageniidae	Epeorus *	
		Heptagenia *	
		Stenacron *	
		Stenonema	5
	Oligoneuriidae	Isonychia *	
	Siphlonuridae	Siphlonurus *	
	Tricorythidae	Leptohyphes *	
		Tricorythodes *	
Hemiptera	Vellidae	Rhagovelia *	
Megaloptera	Corydalidae	Corydalus *	
	Sialidae	Sialis *	
Odonata	Coenagrionidae	Argia *	
Plecoptera	Perlidae	Acroneuria *	
Trichoptera	Brachycentridae	Brachycentrus	40
		Micrasema *	
	Hydropsychidae	Cheumatopsyche	10
		Hydropsyche *	
		Macronemum	1
		Symphitopsyche	10
	Hydroptilidae	Leucotrichia *	
		Stactobiella *	
	Lepidostomatidae	Lepidostoma *	
	Philopotamidae	Chimarra	12
Amphipoda	Gammaridae	Gammarus *	
Cladocera	Leptodoridae	Leptodora *	

TABLE B22. Macroinvertebrate Data for Octoraro Creek at Rising Sun, Md., 1986-93

Order	Family	Genus	Individuals Collected
Decapoda	Cambaridae	Orconectes *	
Pelecypoda	Corbiculidae	Corbicula	2
	Sphaeriidae	Pisidium	2
Haplotaxida	Naididae	Nais *	
Tricladida	Planariidae	Dugesia *	

* Taxa not collected in 1993

NUMBER OF TAXA: 1986-93: 44
1993: 17

RBP SCORE: 32
DIVERSITY INDEX: 3.28

TABLE B23. Macroinvertebrate Data for Ebaughs Creek at Stewartstown, Pa., 1986-93

Order	Family	Genus	Individuals Collected
Coleoptera	Elmidae	Optioservus	34
		Stenelmis	1
	Psephenidae	Psephenus *	
Diptera	Athericidae	Atherix *	
	Chironomidae		29
	Empididae	Hemerodromia	7
	Simuliidae	Simulium *	
	Tipulidae	Antocha *	
		Tipula	1
Ephemeroptera	Baetidae	Baetis	9
		Centroptilum *	
		Pseudocloeon	1
	Caenidae	Caenis *	
	Ephemerellidae	Drunella *	
		Eurylophella *	
		Serratella *	
	Ephemeridae	Ephemera *	
	Heptageniidae	Epeorus *	
		Heptagenia *	
		Stenonema *	
	Leptophlebiidae	Leptophlebia *	
		Paraleptophlebia *	
	Oligoneuriidae	Isonychia	2
	Polymitarcyidae	Ephoron *	
	Potamanthidae	Potamanthus *	
	Tricorythidae	Leptohyphes *	
Lepidoptera	Pyralidae	Petrophila	1
Megaloptera	Corydalidae	Nigronia *	
Odonata	Aeshnidae	Boyeria *	
	Gomphidae	Gomphus *	
		Ophiogomphus *	
Plecoptera	Leuctridae	Leuctra	1
	Perlidae	Acroneuria *	
		Phasganophora *	
Trichoptera	Glossosomatidae	Glossosoma *	
	Hydropsychidae	Cheumatopsyche	3
		Hydropsyche	30
		Symphitopsyche	12

TABLE B23. Macroinvertebrate Data for Ebaughs Creek at Stewartstown, Pa., 1986-93 (Continued)

Order	Family	Genus	Individuals Collected
Trichoptera	Hydroptilidae	Dibusa *	
		Leucotrichia *	
	Philopotamidae	Chimarra *	
	Polycentropodidae	Nyctiophylax *	
Decapoda	Cambaridae	Cambarus *	
Lumbriculida	Lumbriculidae	Rhynchelmis *	
Tricladida	Planariidae	Dugesia *	

* Taxa not collected in 1993

NUMBER OF TAXA: 1986-93: 45
1993: 13

RBP SCORE: 22
DIVERSITY INDEX: 2.77

TABLE B24. Macroinvertebrate Data for Deer Creek at Gorsuch Mills, Md., 1986-93

Order	Family	Genus	Individuals Collected
Coleoptera	Elmidae	Macronychus *	
		Optioservus	21
		Stenelmis	5
	Gyrinidae	Dineutis *	
	Psephenidae	Psephenus	1
	Ptilodactylidae	Anchytarsus *	
Diptera	Rhagionidae	Atherix *	
	Chironomidae		17
	Empididae	Hemerodromia	3
	Simuliidae	Simulium	2
	Tipulidae	Antocha	2
		Tipula *	
Ephemeroptera	Baetidae	Baetis	17
		Centroptilum *	
		Neocloeon *	
		Pseudocloeon	1
	Caenidae	Caenis *	
	Ephemerellidae	Ephemerella *	
		Serratella	3
		Eurylophella *	
	Heptageniidae	Epeorus *	
		Heptagenia *	
		Ironodes *	
		Stenonema	11
	Leptophlebiidae	Paraleptophlebia *	
	Oligoneuriidae	Isonychia	18
	Siphlonuridae	Parameletus *	
	Tricorythidae	Tricorythodes *	
Lepidoptera	Pyralidae	Petrophila *	
Megaloptera	Corydalidae	Corydalus	2
		Nigronia	1
	Sialidae	Sialis *	
Odonata	Aeshnidae	Boyeria *	
	Calopterygidae	Hataerina *	
	Gomphidae	Gomphus *	
		Ophiogomphus *	
		Hagenius *	
Plecoptera	Leuctridae	Leuctra *	

TABLE B24. Macroinvertebrate Data for Deer Creek at Gorsuch Mills, Md., 1986-93 (Continued)

Order	Family	Genus	Individuals Collected
Plecoptera	Perlidae	Acroneuria	1
		Paragnetina *	
		Phasganophora *	
	Perlodidae	Isoperla *	
	Taeniopterygidae	Strophopteryx *	
Trichoptera	Brachycentridae	Brachycentrus *	
	Glossosomatidae	Glossosoma *	
	Hydropsychidae	Cheumatopsyche	18
		Hydropsyche	20
		Symphitopsyche	7
	Hydroptilidae	Dibusa *	
		Leucotrichia *	
		Stactobiella *	
	Philopotamidae	Chimarra *	
Hydracarina *			
Decapoda	Cambaridae	Cambarus *	
Lumbriculida	Lumbriculidae	Rhynchelmis *	

* Taxa not collected in 1993

NUMBER OF TAXA: 1986-93: 55
1993: 18

RBP SCORE: 38
DIVERSITY INDEX: 3.54

TABLE B25. Macroinvertebrate Data for Big Branch Deer Creek at Fawn Grove, Pa., 1988-93

Order	Family	Genus	Individuals Collected
Coleoptera	Elmidae	Optioservus	12
		Stenelmis	1
	Psephenidae	Ectopria *	
		Psephenus	1
	Ptilodactylidae	Anchytarsus *	
Diptera	Chironomidae		32
	Empididae	Hemerodromia *	
	Simuliidae	Simulium	3
	Tipulidae	Antocha	1
		Tipula *	
Ephemeroptera	Baetidae	Baetis	6
		Cloeon *	
		Heterocloeon *	
		Pseudocloeon *	
	Ephemerellidae	Serratella	1
	Heptageniidae	Epeorus	1
		Heptagenia *	
		Leucrocuta *	
		Stenonema	6
	Leptophlebiidae	Paraleptophlebia *	
	Oligoneuriidae	Isonychia *	
	Siphlonuridae	Ameletus	1
Megaloptera	Corydalidae	Chauliodes *	
		Nigronia	1
	Sialidae	Sialis *	
Odonata	Aeshnidae	Boyeria	1
	Calopterygidae	Hetaerina *	
	Gomphidae	Gomphus	4
		Hagenius *	
Plecoptera	Leuctridae	Leuctra	30
	Perlidae	Acroneuria *	
		Phasganophora *	
	Perlodidae	Isoperla	2
Trichoptera	Glossosomatidae	Glossosoma *	
	Hydropsychidae	Cheumatopsyche	5
		Hydropsyche	10
		Potamyia *	
		Symphitopsyche	7

TABLE B25. Macroinvertebrate Data for Big Branch Deer Creek at Fawn Grove, Pa., 1988-93 (Continued)

Order	Family	Genus	Individuals Collected
Trichoptera	Philopotamidae	Chimarra *	
		Dolophilodes	21
	Polycentropodidae	Polycentropus	1
	Psychomyiidae	Lype *	
	Rhyacophilidae	Rhyacophila	1
Decapoda	Cambaridae	Cambarus *	
Hemiptera	Gerridae	Gerris *	
Tricladida	Planariidae	Dugesia *	

* Taxa not collected in 1993

NUMBER OF TAXA: 1988-93: 46
1993: 22

RBP SCORE: 38
DIVERSITY INDEX: 3.47

TABLE B26. Macroinvertebrate Data for Falling Branch Deer Creek at Fawn Grove, Pa., 1988-93

Order	Family	Genus	Individuals Collected
Coleoptera	Elmidae	Optioservus	12
		Stenelmis	17
	Hydrophilidae	Tropisternus *	
Diptera	Chironomidae		34
	Empididae	Hemerodromia	1
	Simuliidae	Simulium *	
	Tipulidae	Antocha	4
		Tipula *	
Ephemeroptera	Baetidae	Baetis	9
		Centroptilum *	
		Heterocloeon *	
		Pseudocloeon *	
	Ephemerellidae	Ephemerella *	
		Serratella	1
	Heptageniidae	Epeorus *	
		Stenonema	7
	Leptophlebiidae	Paraleptophlebia *	
	Oligoneuriidae	Isonychia *	
	Siphlonuridae	Ameletus *	
Megaloptera	Corydalidae	Chauliodes *	
		Nigronia *	
Odonata	Aeshnidae	Boyeria	1
	Gomphidae	Gomphus *	
Plecoptera	Leuctridae	Leuctra	5
	Perlidae	Acroneuria *	
Trichoptera	Glossosomatidae	Glossosoma *	
	Hydropsychidae	Cheumatopsyche *	
		Hydropsyche *	
		Symphitopsyche	12
	Limnophilidae	Goera *	
		Neophylax *	
	Philopotamidae	Chimarra	1
		Dolophilodes *	
	Polycentropodidae	Neureclipsis	1
	Rhyacophilidae	Rhyacophila *	

TABLE B26. Macroinvertebrate Data for Falling Branch Deer Creek at Fawn Grove, Pa., 1988-93 (Continued)

Order	Family	Genus	Individuals Collected
Haplotaxida	Naididae *		
Pelecypoda	Sphaeriidae	Sphaerium *	

* Taxa not collected in 1993

NUMBER OF TAXA: 1988-93: 37
1993: 13

RBP SCORE: 20
DIVERSITY INDEX: 2.94

REFERENCES

Bollinger, S.W., 1991, Water Quality of Interstate Streams in the Susquehanna River Basin, Monitoring Report #4, Water Year 1990: Publication No. 140, Susquehanna River Basin Commission, Harrisburg, Pa.

Bollinger, S.W., 1992, Water Quality of Interstate Streams in the Susquehanna River Basin, Monitoring Report #5, October 1, 1990,-June 30, 1991: Publication No. 146, Susquehanna River Basin Commission, Harrisburg, Pa.

McMorran, C.P., 1988, Water Quality of Interstate Streams in the Susquehanna River Basin, Monitoring Report for 1986 and 1987 Water Years: Publication No. 118, Susquehanna River Basin Commission, Harrisburg, Pa.

McMorran, C.P. and Bollinger, S.W., 1989, Water Quality of Interstate Streams in the Susquehanna River Basin, Monitoring Report #2, 1988 Water Year: Publication No. 122, Susquehanna River Basin Commission, Harrisburg, Pa.

McMorran, C.P. and Bollinger, S.W., 1990, Water Quality of Interstate Streams in the Susquehanna River Basin, Monitoring Report #3, 1989 Water Year: Publication No. 131, Susquehanna River Basin Commission, Harrisburg, Pa.

Omernik, J.M., 1987, Supplement to the *Annals of the Association of American Geographers*, v. 77, no. 1.

Plafkin, J.L., Barbour, M.T., Porter, K.D., Gross, S.K., and Hughes, R.M., 1989, Rapid Bioassessment Protocols for Use in Streams and Rivers: Benthic Macroinvertebrates and Fish: Document No. EPA/444/4-89-001, Office of Water, Environmental Protection Agency, Washington, DC.

K:\DATA\JPAIN\WORD\REPORTS\SCOTT\ISWQN94.DOC